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AMMUNITION RELIABILITY INFORMATION EVALUATION SYSTEM

ARIES USERS' MANUAL

A.P. TRIPPE
P.J. DONOVAN
CALSPAN CORPORATION

JULY 1975

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FOR

AMMUNITION SYSTEMS RELIABILITY & SAFETY DIVISION
PRODUCT ASSURANCE DIRECTORATE
PICATINNY ARSENAL
DOVER, NEW JERSEY 07801

WORK PERFORMED UNDER CONTRACT NUMBERS
DAAA21-74-C-0403
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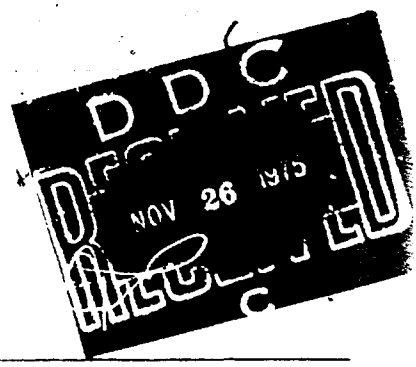

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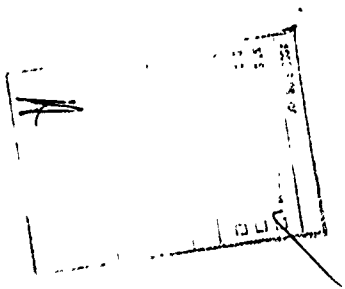

FOREWORD

This Users' Manual has been prepared by Calspan Corporation as partial fulfillment of the requirements specified in Picatinny Arsenal Contracts DAAA21-74-C-0403 and DAAA21-74-C-0492. Technical guidance and assistance at Picatinny was provided by George Covington, Geza Pap, and Sheldon Rachlin of the Ammunition Systems Reliability and Safety Division, PAD. The authors wish to acknowledge with gratitude the considerable contributions made by these gentlemen during the design and development phases of this work. Responsibility for any errors or omissions and for the opinions expressed is solely the authors.

AMMUNITION RELIABILITY INFORMATION EVALUATION SYSTEM
ARIES

Users' Manual

Contents

ii. HOW TO USE THIS MANUAL

ARIES is an acronym for Ammunition Reliability Information Evaluation System. ARIES is a group of data bases and retrieval/analysis capabilities. A user may retrieve data from one or more data bases and then statistically analyze and graphically display that data. Data base access can be either interactive or batch and analysis/display functions are batch operated.

The following documentation symbols are used throughout the manual*:

< >	The enclosed item is user supplied.
[ ]	The enclosed item is mandatory. When more than one choice is shown, the user must pick one.
{ }	The enclosed item is optional and has a default setting if no user option is declared.
Δ	Indicates a blank.
_____	Underlined statements indicate a system response to a command.

These symbols do not appear as actual commands or output. They are documentation conventions only.

All commands which retrieve data end in a %. For example:

PRINT MEAN VEL WHERE LOT EQ MA-012-036%

*These symbols are also applicable to the System 2000 Reference Manual. The more advanced user may desire to consult this manual for intricate, special purpose retrieval instructions.

Also, all lot numbers are in the form:

AAA-000-000 OR AA-000-000

So that MA-1-1 becomes MA-001-001. The request for data concerning lot number MA-1-1 will result in the message "0-data sets selected" unless the lot number is specified in the correct format. This rule also applies to component lot numbers.

A dictionary of common data base terms and acceptable values for specific data elements has been provided as an aid in using this manual. Users not familiar with data base nomenclature are urged to review the definitions therein.

I. INTRODUCTION

This project has developed a data retrieval storage and analysis system which manages performance and test data collected during manufacture and acceptance testing of complete rounds, components, subassemblies, propellants, and fuzes. The set of data files with their retrieval functions and analysis capabilities is referred to as the Ammunition Reliability Information Evaluation System, ARIES. It is expected that ARIES will be useful in evaluating developmental programs, in trouble-shooting problems as they arise and in performing reliability assessments.

Data access can be performed in both the interactive and batch modes. Interactive data access is useful when a user requires a quick, short answer to a question with little or no analysis. Data retrieved interactively is displayed on the screen or teletype. Batch processing of ARIES jobs allows for retrieval of several, large groups of data and for detailed analysis and display of that data.

II. DATA BASE STRUCTURE

ARIES is a special purpose data base structure and data analysis system designed for use by engineering personnel for the storage and analysis of data pertaining to several broad areas of armaments design and production. Component lot assembly data, ballistic and static component test data, and complete round ballistic acceptance test data for artillery, mortar and rocket ammunitions are managed within the ARIES structure. This section will describe from the user's point-how to access and analyze data.

1. ARIES OVERVIEW

ARIES utilizes System 2000 (S2K), a general purpose data base management system, developed and marketed by MRI Systems Corporation, Austin, TX. In order to retrieve data which is meaningful and correctly categorized for analysis, it is necessary for the user to understand some of the basic concepts of how the data is formatted and how to structure retrieval commands. The following pages provide an abbreviated discussion of many of the data manipulation concepts which underlie the S2K data management programs. For a more in-depth discussion of these topics the user is referred to the System 2000 Reference Manual.

ARIES operates on the CDC-6600 computer at Picatinny Arsenal. The data base, the retrieval functions, and the analysis programs all reside on disc files. Program examples in the manual will also provide the control cards necessary to activate these programs.

Figure 1 shows the structure of the Ammunition Reliability Information Evaluation System. User inputs are entered either interactively at a teletype (or screen) or batch in the form of a deck of punched cards. These inputs are interpreted by an S2K natural language program which (i) opens the data base, (ii) retrieves data, (iii) creates formatted data lists, and (iv) provides informational aids to the interactive user. Data bases are maintained

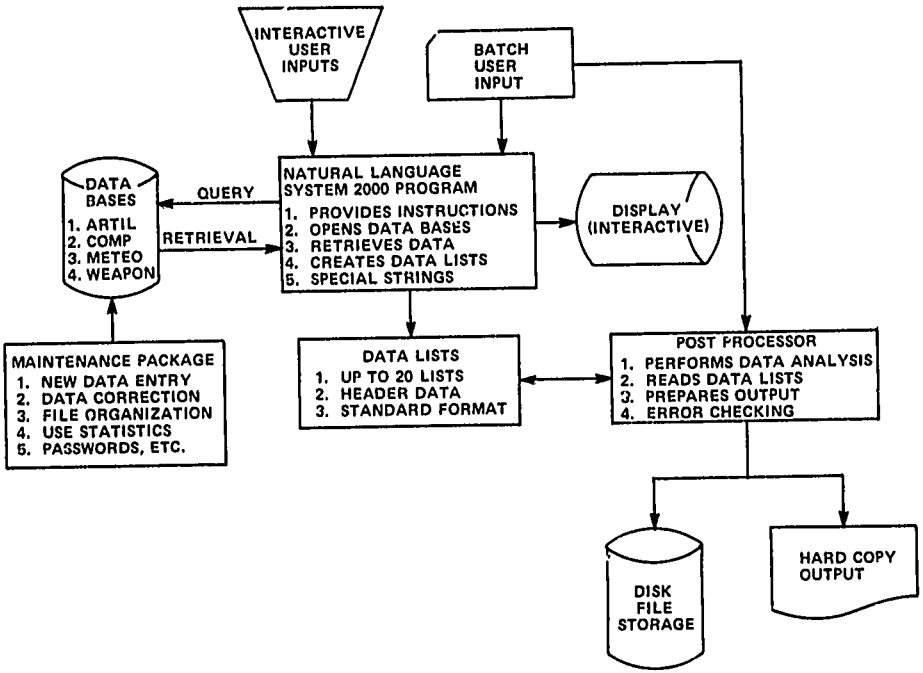

Figure 1 THE AMMUNITION RELIABILITY INFORMATION EVALUATION SYSTEM

as disc files and are accessible to the typical user in the read only mode. Updates and structure changes are performed by use of a maintenance package accessible to those who need it (details for using these programs are provided in the ARIES System Programming Manual). Interactive users receive their data immediately on the device at which they are working. Data lists can be created in the interactive mode and cataloged for future processing. Batch users create formatted data groups (up to a maximum of twenty) which are then read as input to a post processor which provides statistical analyses and graphical displays of the data by groups.

2. DATA BASE DEFINITIONS

A data base definition is a list of all the data items of interest in a logical structure which aids the user in data retrieval. The definition shows the relationships between each data item and all others in the data base. The basic components of the definition are data elements and repeating groups. Values are stored in data elements. Repeating groups describe a structure for storing multiple sets of values and also serve to link hierarchial levels of the definition.

At this point, let us use the data base ARTIL as an example. The definition for ARTIL can be found in the Appendix section of this manual. Each data item in ARTIL has a component number and a component name. Component number one (C1) is named caliber. The information following the component name defines the format in which that piece of information is stored. Elements are either key or non-key (if not specified in the definition an element is key by default). Elements are typed as name, text, integer, decimal, date, or money with varying lengths (e.g. name X(10) is a ten-character name or integer 9(6) is a six-digit number). These element formats have little effect on the retrieval process and, therefore, will not be discussed in detail. It is sufficient to state that only numeric elements may be processed by the analysis routines. That is to say that it is incorrect to request a mean and standard deviation of the lot numbers and if this occurs, a processing error will result.

3. REPEATING GROUPS

The definition for ARTIL is indented at several points. Each indentation signifies a repeating group level. It is the repeating group concept that allows multiple occurrences of data set information and associated elements and/or associated lower level repeating groups. These associations are always specified within the component description. Elements and repeating groups are always members of some repeating group, thus the repeating group relationship is as shown for the ARTIL definition. Figure 2 is the repeating group structure for ARTIL. Notice how the data for a lot of ammunition is clustered at each level. Level zero is the basic lot data and at this level the repeating group relationship is not specified but implicitly related to component number zero which is referred to as ENTRY. For all non-level-zero elements the repeating group specification is explicit and shows in the definition.

In ARTIL, there are four repeating groups on level one as shown. Four more exist at level two, three at level three and two at level four. This repeating group structure is the means by which data can be retrieved from any branch of the data tree without a sequential search of the entire data base.

4. DATA STRUCTURE

Let us now look at how the values for a specific lot of ammunition would fit into the ARTIL structure. Figure 3 illustrates typical data value storage in ARTIL. KN-816-095 is 37,125 rounds of 105mm, HE, M1 ammunition which were tested and accepted at Jefferson Proving Ground on February 20, 1975. The level zero data is shown in Figure 4. Notice how the first seventeen data elements in the ARTIL definition are filled with the specific data for lot number KN-816-095. The next element in the definition is number 100* ARTILLERY TEST INFO(RG) which is a level one repeating group. Figure 5 shows the elements in this repeating group and the values for the example lot. This repeating group is referred to as RG100. The definition next shows 200* HE WP FORMAT INFO(RG in 100) or RG200. The elements in RG200

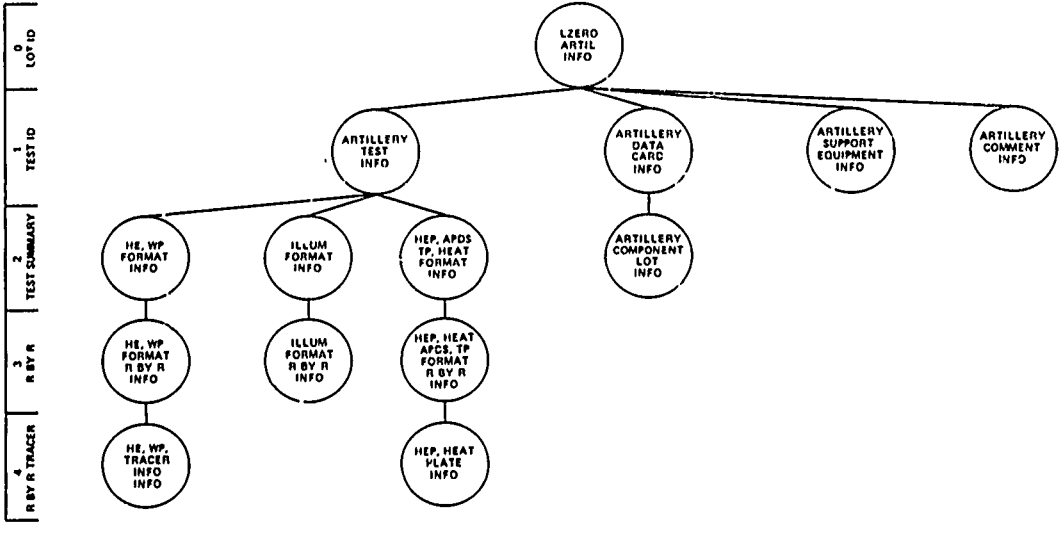

FIGURE 2 ARTILLERY DATA BASE STRUCTURE

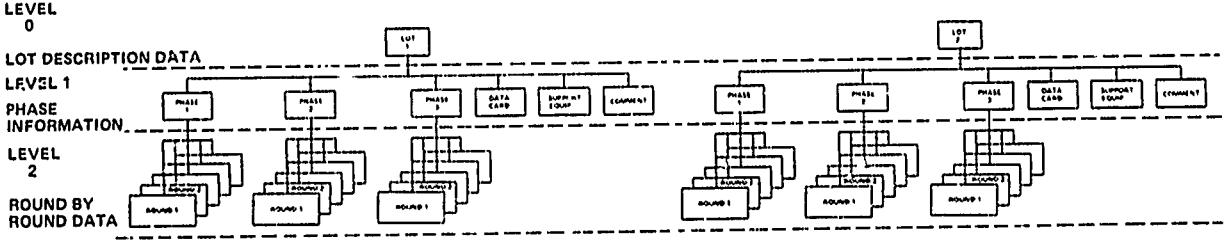

Figure 3 DATA VALUES STORAGE IN ARTIL

```
CALIBER* 105 MM
TYPE* HE
LOT* KN-E16-095
M NUMBER* M1
QUANTITY*  37125
MANUFACTURER* KANSAS
INITIAL DISP* ACCEPTED
FINAL DISP* ACCEPTED
PROVING GROUND* JEFFERSON
TEST DATE* 02/20/1975
ASSEMBLY DATE* -NULL-
TYPE TEST* FIRST TEST
FIRING RECORD NUMBER* 374
ITEM NOMENCLATURE*  CTG, 105MM, HE, M1 DUALGRAN, W/SUPPL CHG W/O FUZE F
      /HCW -M2A1,M2A2,M49,M103,M137
CAUSE OF REJECTION*  NONE

RELATED FIRING RECORD* NONE
CORRECTION* 1 MPS
SPECIFICATION* -NULL-
DRAWING* -NULL-
```

FIGURE 4 LEVEL ZERO ELEMENTS WITH VALUES

```
1* 105 MM
2* HE
3* KN-816-095
4* M1
5*  37125
6* KANSAS
7* ACCEPTED
8* ACCEPTED
9* JEFFERSON
10* 02/20/1975
12* FIRST TEST
13* 374
14*  CTG, 105MM, HE, M1 DUALGRAN, W/SUPPL CHG W/O FUZE F/HCW -M2A1,M2A2
      ,M49,M103,M137
15*  NONE

16* NONE
17* 1 MPS
```

TEST NAME* ACCEPTANCE
TEST PHASE* VEL AMB
REF VS TEST* REF
DATE FIRED* 02/20/1975
APPROX TIME FIRED* 912
AZIMUTH* 353.90
TARGET DISTANCE* -NULL-
FIRING POSITION* A-13
WIND VELOCITY* -NULL-
WIND DIRECTION* -NULL-
PROP CHG* 7 INCR
TEST REMARKS* FUNCTION, AMB

MALFUNCTIONS* -NULL-
TEST SAMPLES* 10

Level One
Artillery Test Info

VEL N* 10
VEL UNCORR MEAN* 464.00
VEL CORR MEAN* -NULL-
VEL STD* 1.70
VEL MAXIMUM* 467.00
VEL MINIMUM* 462.00
PRES N* -NULL-
PRES MEAN* -NULL-
PRES MAXIMUM* -NULL-
PRES MINIMUM* -NULL-
RNG N* -NULL-
RNG MEAN* -NULL-
RNG STD* -NULL-
RNG MAXIMUM* -NULL-
RNG MINIMUM* -NULL-
DEFL N* 10
DEFL MEAN* 260.0
DEFL STD* .0
TRACER N* -NULL-
TRACER MEAN* -NULL-
TRACER MAXIMUM* -NULL-
TRACER MINIMUM* -NULL-
FLAG* -NULL-

Level Two
HE, WP, Format Info

RND NO* 1955
SAMP NO* 1
PROJ FUNC* -NULL-
FUZE ACTION* -NULL-
VEL* 467.0
RNG* -NULL-
DEFL* 260
PRES* -NULL-
WT* -NULL-
REMARKS* -NULL-
RFLAG* -NULL-
HE-WP DEFECT* -NULL-

Level Three
HE, WP, Format Round
By Round Information

FIGURE 5 LEVEL ONE, TWO, AND THREE ELEMENTS AND VALUES

and the example values are also shown in Figure 5. RG280 is a repeating group in RG200 and contains elements which refer to round by round measurements. Values for the first round fired in lot KN-816-095 are also shown in Figure 5. Looking at the data values in Figures 4 and 5, and at the definition and the tree structure (Figure 2) one can see that the data for KN-816-095 is stored in an easily defined manner so that any one data value may be accessed quickly.

Figure 6 is the elements for RG280 with the values for the second through fifth rounds. This illustrates the use of the repeating group structure for data storage. It was not necessary to define elements for each round fired, but rather data for each round is stored in a generalized definition (RG280) which allows for repeated value insertions. We see in Figure 5 that 10 rounds were fired (Test Samples = 10) and therefore we would expect to find 10 sets of data in RG280 (only the first five are shown here).

So far we have seen the level zero data and the data concerning the reference phase of the acceptance test for KN-816-095. The results of the test phase are stored as a second set of data in RG100. Figure 7 shows the data for the test and safety phases in the RG100, RG200, and RG280 structures. Notice how the data for this example lot has now been layered onto the definition in a hierarchical manner so that each value is uniquely stored and can be identified by lot number, phase name, and round number for easy access.

The tree structure in Figure 2 shows three level one repeating groups of data in addition to the test information discussed above. Data card, support equipment, and comment information groups contain the values for KN-816-095 as presented in Figure 8. With the inclusion of this data, all the important manufacturing and acceptance test results are stored in data base ARTIL and can be retrieved by referencing either the element number or name.

```
RNL NO*  1956
SAMP NO*   2
PROJ FUNC* -NULL-
FUZE ACTION* -NULL-
VEL*  466.0
RNG* -NULL-
DEFL*  260
PRES* -NULL-
WT* -NULL-
REMARKS* -NULL-
RFLAG* -NULL-
ME-WP DEFECT* -NULL-

RNL NO*  1957
SAMP NO*   3
PROJ FUNC* -NULL-
FUZE ACTION* -NULL-
VEL*  465.0
RNG* -NULL-
DEFL*  260
PRES* -NULL-
WT* -NULL-
REMARKS* -NULL-
RFLAG* -NULL-
ME-WP DEFECT* -NULL-

RNL NO*  1958
SAMP NO*   4
PROJ FUNC* -NULL-
FUZE ACTION* -NULL-
VEL*  464.0
RNG* -NULL-
DEFL*  260
PRES* -NULL-
WT* -NULL-
REMARKS* -NULL-
RFLAG* -NULL-
ME-WP DEFECT* -NULL-

RNL NO*  1959
SAMP NO*   5
PROJ FUNC* -NULL-
FUZE ACTION* -NULL-
VEL*  463.0
RNG* -NULL-
DEFL*  260
PRES* -NULL-
WT* -NULL-
REMARKS* -NULL-
RFLAG* -NULL-
ME-WP DEFECT* -NULL-
```

FIGURE 6 LEVEL THREE ELEMENTS WITH REPEATING VALUES

```
TEST NAME* ACCEPTANCE
TEST PHASE* VEL ARD
REF VS TEST* TEST
DATE FIRED* 02/20/1975
APPROX TIME FIRED*  913
AZIMUTH* 353.90
TARGET DISTANCE* -NULL-
FIRING POSITION* M-15
WIND VELOCITY* -NULL-
WIND DIRECTION* -NULL-
PROP CHG* 7 INCR
TEST REMARKS*  FUNCTION, ARD

MALFUNCTIONS* -NULL-
TEST SAMPLES*    10

  VEL N*  10
  VEL UNCORR MEAN*   467.00
  VEL CORR MEAN*   465.00
  VEL STD*   1.20
  VEL MAXIMUM*   467.00
  VEL MINIMUM*   465.00
  PRES N* -NULL-
  PRES MEAN* -NULL-
  PRES MAXIMUM* -NULL-
  PRES MINIMUM* -NULL-
  RNG N* -NULL-
  RNG MEAN* -NULL-
  RNG STD* -NULL-
  RNG MAXIMUM* -NULL-
  RNG MINIMUM* -NULL-
  DEFL N*  10
  DEFL MEAN*  260.0
  DEFL STD*    .0
  TRACER N* -NULL-
  TRACER MEAN* -NULL-
  TRACER MAXIMUM* -NULL-
  TRACER MINIMUM* -NULL-
  FLAG* -NULL-

    RND NO*  1956
    SABOT NO*   1
    PROJ FUNC* -NULL-
    FUZE ACTION* -NULL-
    VEL*  467.0
    RNG* -NULL-
    DEFL*  260
    PRES* -NULL-
    WT*  52.50
    REMARKS* -NULL-
    RFLAG* -NULL-
    RE-OF DEFECT* -NULL-
```

FIGURE 7 TEST PHASE REPEATING VALUES

```
110* ACCEPTANCE
111* SAFETY
112* TEST
113* 02/20/1975
114*  957
115* 352.87
117* H-12
120* EXCESS
123*   5

 220*   5
 221*    427
 222*    431
 223*    415
 240*   5
 241* -150.0
 242*     .0

  281*  1153
  282*  1
  287* -150
  288* 415

  281*  1154
  282*  12
  287* -150
  288* 430

  281*  1155
  282*  13
  287* -150
  288* 429

  281*  1156
  282*  14
  287* -150
  288* 430

  281*  1157
  282*  15
  287* -150
  288* 431
```

FIGURE 7 (CONT'D.) SAFETY PHASE REPEATING VALUES

```
EQUIP NAME* HOW. 105MM
EQUIP MODEL* M2A2
EQUIP LOT* 18913

EQUIP NAME* TUBE,105MM
EQUIP MODEL* M2A2
EQUIP LOT* 67573

EQUIP NAME* CARRIAGE
EQUIP MODEL* M2A2
EQUIP LOT* 6567

EQUIP NAME* RECOIL
EQUIP MODEL* M2A2
EQUIP LOT* 2370

EQUIP NAME* HOW. 105MM
EQUIP MODEL* M137E1
EQUIP LOT* 2052

EQUIP NAME* TUBE,105MM
EQUIP MODEL* M137E1
EQUIP LOT* 68126

EQUIP NAME* CARRIAGE
EQUIP MODEL* M31
EQUIP LOT* 790

EQUIP NAME* RECOIL
EQUIP MODEL* M37
EQUIP LOT* 2636

COMMENTS* ALL VEL CORR TO PROJ WT=33 LB.
COMMENTS* PERCNT LOT DEF= 0.00
```

ARTILLERY SUPPORT EQUIPMENT

ARTILLERY COMMENT INFORMATION

FIGURE 8 ADDITIONAL LEVEL ONE DATA

III. DATA RETRIEVAL

As illustrated in Figure 1, several data retrieval formats exist within ARIES. Interactive data requests result in an immediate display on the peripheral in use; data lists can be created either interactively or batch; data lists can be stored as permanent disc files or they can be used as input files to the analysis routines; data lists or analysis outputs are available from line printers. Interactive and batch retrievals will be discussed separately. A few System 2000 concepts will also be discussed.

1. String Concept in System 2000

A string is a predefined command which when executed results in the performance of multiple S2K commands. The use of strings is particularly useful when a user has a repetitive or lengthy retrieval and would like to refer to this series (or string) of commands by some shortened code word.

There are two types of strings. The first, the simple string, allows the definition of a series of S2K commands directly callable by nothing other than the string number or name. No variables are allowed in the simple string. The second type, the extended string, also allows the definition of a series of S2K commands, but these commands may contain symbolic arguments which are satisfied by the substitution of actual arguments when the extended string is executed.

An example of a simple string can be found in data base ARTIL, component number 4030.

4030 * TALLY(STRING $ TALLY/EACH/C1% TALLY/EACH/C2% TALLY/EACH/C4%$)

This simple string will execute the three S2K commands shown above in the string definition. It results in the printing of each unique value for components C1, C2, and C4 (caliber, type, and H-number). In order to call this series of S2K commands the user must punch on a card or type into the system:

TALLY OR *C4030*

The output will appear on the screen or as part of the output file for a batch program. Further explanation of this string and other available strings can be found in Appendix A.

An example of an extended string can be found in data base ARTIL, component number 4005.

```
4005 * DISPLAY (STRING $ PRINT/NAME, STUB, GROUP, NULL SUPPRESS, REPEAT
       SUPPRESS/BY ENTRY, C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C12,
       C13, C14, C100, C200, C300, C400, C920, C98 WHERE C3 EQ *1* % $)
```

This extended string will execute this lengthy command when it is called in the following manner:

*DISPLAY(MA-014-492)% OR *C4005(MA-014-492)%

The lot number provided as an argument during execution is substituted between the asterisks where the number "1" appears in the string. Extended strings with multiple arguments are also possible. The four argument string CSUM is called by:

*CSUM(81 MM,HE,01/01/74,01/31/74)%

and will list summary data for all 81MM, HE lots manufactured during January 1974. The use of extended strings is also described in Appendix A.

2. The 'WHERE' Clause in System 2000

The purpose of the WHERE clause is to specify the conditions required to qualify data sets from which retrievals are to be made. For example:

PRINT LOT WHERE MEAN VEL LQ 850%

The ARIES user must understand the WHERE clause structure because some of the strings discussed in Appendix A require a legal where clause as an input argument.

The object of a where clause must be a keyed data item (see Section II.2). A quick look at the definition will tell the user whether the where clause object item is a key or non-key element. If an element is not specified as being non-key, it is assumed to be a key element.

The conditions modifying WHERE can be simple or complex combinations of restrictions on the qualifying data sets. All WHERE clauses employ system operators of one type or another -- e.g., EXISTS, FAILS, EQ, NE, LT, LE, GT, GE, and SPANS. Most are self-explanatory, and no more than a brief knowledge of their meanings should be necessary to understand this discussion.

The effect of a WHERE clause is to focus data retrievals on just those segments of the data base of specific interest. Without a WHERE clause, the entire data base qualifies and every valued retrieval component specified will be output. There would be considerable difference in the output produced from the ARTIL data base, for example, by issuing these two commands:

```
PRINT CALIBER%
PRINT CALIBER WHERE LOT EQ 'A-014-495%
```

In a retrieval command containing a WHERE clause, the WHERE clause is processed first to determine which portion of the data base should be considered for those actions specified to the left of the WHERE clause. The normalizing concept has to do with the problem of selecting the appropriate elements or repeating groups for retrieval. This is important to the user because, understanding the concept, he can construct his command to achieve the unique results desired.

Three new terms are required at this point to assist in the understanding of this concept.

a. Specified Data Sets - the data sets implicitly identified by the components listed to the left of the WHERE clause statement in a retrieval request. The component may be identified by name or by number. The data sets are implicitly identified by requesting elements within the data sets or naming

the repeating group which generates the Specified Data Sets. The level within the data base structure where these Specified Data Sets occur is of great importance. If elements are used to identify the Specified Data Sets, then the elements and the data sets will be at the same level, since the elements come from within the data set. If a repeating group is used to identify the sets, then the Selected Data Sets will occur at one level below the listed repeating group.

b. Qualified Data Sets - data sets that satisfy the entire WHERE clause condition(s). When the system starts processing a command it processes the WHERE clause first. Those data sets which satisfy all the conditions in the WHERE clause are temporarily "collected" and tested to see if any of the Qualified Data Sets are named or implied by the Specified Data Sets. If they are, they become:

c. Selected Data Sets - data sets produced from the Qualified Data Sets. That is, those data sets named by the Specified Data Sets and selected by qualification for retrieval.

As explained previously, some retrieval requests do not use the WHERE clause. If the request contains no WHERE clause, then the entire data base qualifies for output. If a WHERE clause is used, but no data sets satisfy the conditions imposed by the WHERE clause, no action is taken for the request. If a list of Qualified Data Sets is produced, then each Qualified Data Set is examined to see if it is also a Specified Data Set. If it is, then it becomes a Selected Data Set. If all components in the WHERE clause reference only the Specified Data Sets, then all Qualified Data Sets are also the Selected Data Sets. The following example uses the ARTIL Data Base Definition and Data Base Structure.

PRINT VEL CORR MEAN, PRES MAXIMUM, RNG MEAN WHERE LOT EQ LS-067-133%

OR

PRINT C212, C222, C231 WHERE C3 EQ LS-067-133%

Effect: There is only one qualified data set and when it is selected the following output will result:

212 * 351.38
222 * -NULL-
231 * 1048

212 * 874.54
222 * 82
231 * 4659

Two sets of data are generated because data exists for both the one increment and nine increment firing phases. To obtain only one set of data the where clause should be:

WHERE LOT EQ LS-067-133 AND TEST PHASE EQ 1 INCR%

OR

WHERE C3 EQ LS-067-133 AND C111 EQ 1 INCR%

3. Interactive ARIES Retrievals

The first step in the performance of an interactive ARIES retrieval is to LOGIN at a teletype or screen location. It is assumed that the user knows how to do this. The following steps should then be performed.

COMMAND
ATTACH,ABSFIL,ID=ASRSD
PFN = ABSFIL
CYCLE NO. = 1
COMMAND

ABSFIL.
07/07/75 14.17.15*BEGIN SYSTEM 2000*
USER,PAD%
#
DATA BASE NAME IS <DBN> %
ASSIGNED <DBN> 47 37 06/18/75 14.13.08
*

Legal arguments for the data base name (DBN) are ARTIL, COMP, etc.

At this p· ıt strings or S2K commands may be typed into the system. All requested outputs w· l be prir·d on the screen unless a report file is named. This is accomplished by typing:

REPORT FILE IS ogical file name⟩ %

where logical file name is any 1-7 character-file name acceptable to CDC operating system. This command directs all outputs to the logical file which then can be manipulated as any other CDC system file.

The interactive execution of strings must be approached with a note of caution. The user should execute from a teletype or screen only those strings in Appendix A which have a suggested operating mode of INTERACTIVE. Those strings labeled as BATCH will produce a large volume of data in a 130-character wide format suitable for line printer display. On a teletype, this format is time consuming and unsightly due to wrap around which results from overflow of the teletype field.

There are several help commands embedded in ARIES to aid the user by (1) listing the basic ARIES strings and (2) providing instructions for their use. For a list of all the ARIES strings available within a data base, type:

HELPCOMMAND%

To obtain instructions for any one of these commands, type:

*HELPI(XXXX)%

where XXXX is the ARIES string name.

The instructions for each command are subdivided into three sections. They are:

FUNCTION - Lists purpose of string
USAGE - Describes how to use string
EXAMPLE - Provides an actual example

The HELP1 string displays all three sections. If only one section is desired, the HELP2 string is used.

*HELP2(XXXX,YYYY)
where XXXX is the ARIES string name
and YYYY is the name of the section.

*HELP1(SUMMARY) will display a three section description of the ARIES string called SUMMARY.
*HELP2(SUMMARY,EXAMPLE) will only display the example section of the instructions.

To obtain a synopsis of these instructions, the user need only type *HELP*%.

4. Batch Processing of ARIES Retrievals

Deck structure for the batch processing of ARIES retrievals is shown in Figure 9. The control cards are as shown except that the user must use his cost center and charge codes on the comment card.

All strings and S2K commands may be placed on punched cards in the section indicated. All strings and commands end in a percent sign. The output is returned via the line printer at the point of deck input unless otherwise specified. The formats and definitions of the strings can be found in Appendix A. For the user who wishes to construct his own strings, reference is made to the System 2000 Reference Manual for instructions.

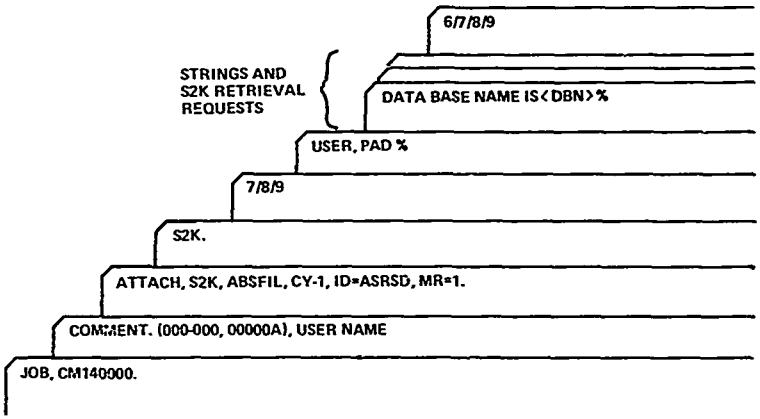

Figure 9 DECK STRUCTURE FOR BATCH PROCESSING RETRIEVALS

IV. DATA ANALYSIS

ARIES allows the user to retrieve groups of data using a set of strings. These groups (or files) of data can then be read by a post processor which will display and analyze retrieved groups.

1. Deck Structure

The deck structure for ARIES data retrieval and analyses is shown in Figure 10. The user must put his own cost center and charge codes on the comment card.

The data retrieval section is a set of punched cards each requesting a group of data to be retrieved for subsequent analysis. Each card calls an extended string with two arguments. The use of these strings (FILE1, FILE2, FILE3, . . . FILE19, FILE20) is explained in the Analysis Commands Section of Appendix A. One to twenty data files can be created with these strings. The first argument of each string is the component name or number for the data to be stored on the local file. The second argument is a legal System 2000 WHERE clause which qualifies the data set being retrieved. For example:

```
*FILE14(LOT, CALIBER EQ 81MM)%
```

will retrieve all the lot numbers for all the 81mm lots stored in data base ARTIL. This list of lot numbers will exist on a local file called FILE14.

The data analysis section contains a set of punched cards which allow the user to specify which local files of retrieved data should be analyzed and the manner in which the data will be displayed or analyzed. The available analysis routines are presented in Appendix B. The format of the input data analysis section is the same as the format for a NAMELIST reader input. That format is a blank in column one followed by a dollar sign and an analysis routine name. The arguments for each routine are separated by commas and the end of the arguments is denoted by another dollar sign. For example:

```
 $MREG LIST=1, IDEP=11, IND1=5, IND2=3, IRES=1$
```

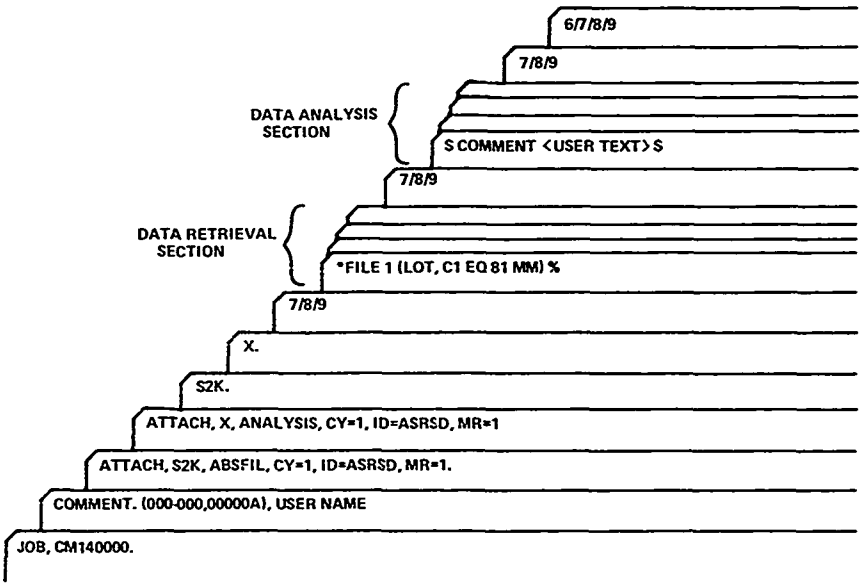

Figure 10 DECK STRUCTURE FOR DATA RETRIEVAL AND ANALYSIS

will request a multiple regression analysis with a list of the raw data with the data in FILE11 as the dependent variable and the data in FILE5 and FILE3 as independent variables. A list of the residuals is also requested.

Several examples of retrieval and analysis programs are presented in the Examples Section of this manual.

DICTIONARY

Analysis Commands	- Those instructions by which the user defines how he wants the data analyzed and displayed. For example, the analysis commands may request a multiple regression analysis and a plot of variable A vs. variable B.
Batch Processing	- A batch processed program is one that is presented to the computer through the input queue, and competes with other jobs in that queue for access to the computer. A batch job is normally a deck of punched cards passed through a card reader. See interactive processing.
Catalog	- The process whereby a local file is made permanent and thereby recoverable at a later time.
Data Base	- A non-redundant collection or interrelated data items processable by one or more techniques.
Data Element	- The unique name used for specifying a single set of element values. In ARIES a data element may be the "C" number or the element name (e.g. C1 or caliber is a specific data element). See data value.
Data List	- The set of all data values resulting from a specific retrieval command. This list is usually a local file.
Data Value	- The stored information are data values. Data values are stored in specific data elements. Usually several data values exist within each data element (e.g. for the data element C3*LOT, the data values are all individual lot numbers).

Disc Files - Disc files are those files which are stored on computer central site devices called disc packs. Data, programs or command sequences can be stored as disc files. Disc files are permanent records which can quickly be read into computer memory.

Format - The physical configuration of the data. There are input data formats, storage formats and output formats. Data formats are important because computers are usually programmed to expect data is a strictly defined configuration and unformatted or wrong formatted data is not interpretable by the machine. A typical data format may be I4 which means an integer number with four significant digits. To express the number twleve in I4 format is 0012.

Interactive Processing - An interactive program is one that is presented to the computer through a dedicated input channel and is processed almost immediately. An interactive job is normally executed from a teletype and allows the user to input data during processing so that an interaction between the program logic and the user exists.

Key Element - A data element name which is specified as a key element in the definition has an auxiliary table associated with it. In this table, all the data values are segmented into ordered groups. The table also contains storage addresses for each data value. When a retrieval is requested for key element values, the segmented table is used to select those values which meet the request criteria. The use of this table eliminates the time consuming need to sequentially retrieve from disc and test each data

value. The number of key elements dictates the amount of storage space necessary for a data base because the auxiliary tables do require storage areas.

Local File - The CDC Scope operating system allows the user to create groups of data or commands or programs on files each having a unique name. These files when created are local files which will be lost upon conclusion of the job. In order not to lose one or more of these files, the user must issue a catalog command for each file he desires to be recoverable for another job. The issuance of a catalog command causes a copy of the file to be stored as a permanent disc file from which it can be recovered when needed.

Logical Structure - The logical structure of a data base is the set of relationships between data elements in the data base. The understanding of the logical structure of a data base will aid the user in structing data retrievals.

Non-Key Element - A non-key data element has no auxiliary table associated with it; therefore, it takes less storage than a key element. However, the retrieval of a subset of the data values from a non-key element requires a time consuming sequential search through all stored values for that element.

Permanent File - A permanent file is one whose contents are not lost upon completion of a job. See local file.

Query	- The act of requesting specific select data values from the data base. A query is a structured request for qualified data values.
Read Only Programs	- When a program is catalogued as a permanent file, the access to it may be specified in a variety of ways. A set of passwords control this access and only those who know the passwords may change, purge or extend the program. A read only program can be read and executed by anyone who attaches it, but may be altered only by those who know the passwords.
Retrieval	- The act of grouping a set of specific data values in an output file. See query.
Structure	- The structure of a data base consists of the definition and the repeating group structure which defines the hierarchy of data storage levels. See logical structure.
S2K Natural Language	- The syntax whereby retrievals can be made from an S2K data base.
Update	- The process of adding new data or deleting obsolete data from a data base.

APPENDIX A

STRINGS

GENERAL INSTRUCTIONS

STRING INVOCATION

BATCH MODE USAGE:

FROM CARDS:

```
USER, PAD%
DBN IS <DATA BASE NAME> %
  <STRING> %
EXIT%
```

FROM SCREEN OR TELETYPE:

```
USER, PAD%
DBN IS <DATA BASE NAME> %
REPORT FILE IS XXX%
  <STRING> %
EXIT%
BATCH, XXX, PRINT, AA, ABC.
   where:
   AA = ID FOR 200 USER TERMINAL WHERE FILE IS TO PRINT
  ABC = NAME OF FILE AFTER BATCHING IS COMPLETED
```

INTERACTIVE MODE USAGE:

FROM SCREEN OR TELETYPE:

```
USER, PAD%
DBN IS <DATA BASE NAME> %
  <STRING> %
     (STRING OUTPUT APPEARS ON SCREEN OR TELETYPE)
EXIT%
```

HELP COMMANDS

STRING: HELP

NUMBER: 1060

DATA BASE: ARTIL, COMP, LAW, TM075, WEAPON

SUGGESTED OPERATING MODE: INTERACTIVE OR BATCH

PURPOSE: TO PROVIDE USERS WITH INSTRUCTIONS FOR USING THE THREE BASIC HELP COMMANDS -- *HELPCOMMAND*, *HELP1( )* AND * HELP2(,)*.

USAGE: *HELP**

OR

C1060 %

SAMPLE OUTPUT:

HELP

```
HELP
  FUNCTION
     THE PURPOSE OF THE SEVERAL HELP COMMANDS IS TO-
        1)LIST ALL AVAILIABLE COMMANDS
        2)PROVIDE INSTRUCTIONS FOR USING BASIC ARIES COMMANDS
  USAGE
     *****   ALL COMMANDS MUST BE FOLLOWED BY A PERCENT SIGN   *****
     FOR LIST OF ALL COMMANDS AVAILIABLE IN ARTIL, TYPE
           *HELPCOMMAND*
     THE INSTRUCTIONS FOR EACH COMMAND ARE SUBDIVIDED INTO 3 SECTIONS

        THESE 3 SECTIONS ARE
           A)FUNCTION-LISTS PURPOSE OF COMMAND
           B)USAGE   -DESCRIBES HOW TO USE COMMAND
           C)EXAMPLE -GIVES EXAMPLE OF COMMAND USE
     TO LIST FUNCTION,USAGE AND EXAMPLE OF COMMAND XXXX, TYPE
           *HELP1(XXXX)
              WHERE XXXX = ARIES COMMAND NAME
     TO LIST ONLY THE FUNCTION,USAGE OR EXAMPLE OF COMMAND XXXX, TYPE

           *HELP2(XXXX,YYYY)
              WHERE XXXX = ARIES COMMAND NAME
                    YYYY = FUNCTION,USAGE OR EXAMPLE
  EXAMPLE
     *****   ALL COMMANDS MUST BE FOLLOWED BY A PERCENT SIGN   *****
     SAMPLE FOR COMMAND HELPCOMMAND
       LIST ALL BASIC ARIES COMMANDS
         *HELPCOMMAND*
     SAMPLE FOR COMMAND HELP1
       LIST FUNCTION,USAGE AND EXAMPLE OF ARIES COMMAND COMPLOT
         *HELP1(COMPLOT)
     SAMPLE FOR COMMAND HELP2
       LIST ONLY USAGE OF ARIES COMMAND COMPLOT
         *HELP2(COMPLOT,USAGE)
```

STRING: HELPCOMMAND

NUMBER: 1090

DATA BASE: ARTIL, COMP, LAW, TWO7S, WEAPON

SUGGESTED OPERATING MODE: INTERACTIVE OR BATCH

PURPOSE: TO LIST ALL BASIC COMMANDS AVAILABLE TO ARIES USERS. ONLY THOSE COMMANDS APPLICABLE TO THE ATTACHED DATA BASE ARE LISTED.

USAGE: *HELPCOMMAND* %

OR

C1090 %

STRING: HELP1

NUMBER: 1070

DATA BASE: ARTIL, COMP, LAW, TWO75, WEAPON

SUGGESTED OPERATING MODE: INTERACTIVE OR BATCH

PURPOSE: TO LIST INSTRUCTIONS FOR USING A USER SELECTED ARIES COMMAND. THE INSTRUCTIONS FOR EACH COMMAND ARE SUBDIVIDED INTO 3 SECTIONS:

a). FUNCTION - LISTS PURPOSE OF COMMAND.

b). USAGE - DESCRIBES HOW TO USE COMMAND.

c). EXAMPLE - GIVES EXAMPLE OF COMMAND USE.

THE HELP1 COMMAND LISTS ALL 3 OF THE ABOVE FOR SELECTED COMMAND.

NOTE: SEE COMMAND HELP2 FOR INSTRUCTIONS ON HOW TO RETRIEVE ONLY THE FUNCTION, USAGE OR EXAMPLE INSTRUCTIONS. SEE COMMAND HELPCOMMAND FOR LIST OF ALL AVAILABLE COMMANDS.

USAGE: *HELP1(ARG1)%

OR

*C1070(ARG1)%

ARGUMENTS: ARG1 = ARILS COMMAND NAME

EXAMPLE: *HELP1(COMPLOT)%

LISTS FUNCTION, USAGE AND EXAMPLE OF ARIES COMMAND COMPLOT

STRING:	HELP2
NUMBER:	1080
DATA BASE:	ARTIL, COMP, LAB THO75, WEAPON
SUGGESTED OPERATING MODE:	INTERACTIVE OR BATCH
PURPOSE:	TO LIST INSTRUCTION SUBSET FOR USER SELECTED ARIES COMMAND. THE INSTRUCTIONS FOR EACH COMMAND ARE SUBDIVIDED INTO 3 SECTIONS: a). FUNCTION - LISTS PURPOSE OF COMMAND b). USAGE - DESCRIBES HOW TO USE COMMAND c) EXAMPLE - GIVES EXAMPLE OF COMMAND USE THE HELP2 COMMAND LISTS EITHER THE FUNCTION, USAGE OR EXAMPLE OF THE SELECTED COMMAND. NOTE: SEE COMMAND HELP1 FOR INFORMATION ON HOW TO RETRIEVE COMPLETE INSTRUCTIONS FOR THE SELECTED COMMAND. SEE COMMAND HELPCOMMAND FOR LIST OF ALL AVAILABLE COMMANDS.
USAGE:	*HELP2(ARG1, ARG2)% OR *C1080(ARG1, ARG2)%
ARGUMENTS:	ARG1 = ARIES COMMAND NAME ARG2 = FUNCTION, USAGE OR EXAMPLE
EXAMPLE:	*HELP2(COMPLOT,USAGE)% LISTS USAGE OF ARIES COMMAND COMPLOT.

SAMPLE OUTPUT:

HELP COMMAND

```
        ARIES COMMAND SUMMARY
              09/18/75


          COMMAND NAME
        **
          HELP
          FILE1
          SUMMARY
          DISPLAY
          COMPLOT
          CSEARCH
          HEXPER
          ILLUMER
          HEPHEATER
          ASUM
          BSUM
          CSUM
          CROSS
          ACROSS
          TALLY
          TYPESUM
          CALSUM
          CALTYPE
          DISPOSITION
          DATESUM
```

HELP1

```
COMPLOT
  FUNCTION
     THIS COMMAND PROVIDES COMPONENT LOT INFORMATION FOR A SPECIFIED
     COMPLETE ROUND LOT NUMBER.  THE NAME,LOT NUMBER,QUANTITY USED
     AND MANUFACTURER ARE GIVEN FOR EACH COMPONENT.
  USAGE
        *COMPLOT(ARG1)  OR  *C4006(ARG1)  WHERE
             ARG1 = COMPLETE ROUND LOT NUMBER
  EXAMPLE
     *****   ALL COMMANDS MUST BE FOLLOWED BY A PERCENT SIGN   *****
        *COMPLOT(PA-014-492)
```

HELP2

```
      COMPLOT
        USAGE
              *COMPLOT(ARG1)  OR  *C4006(ARG1)  WHERE
                   ARG1 = COMPLETE ROUND LOT NUMBER
```

BATCH DATA RETRIEVAL COMMANDS

STRING: FILE1
FILE2
FILE3
⋮
FILE19
FILE20

NUMBER: 2001
2002
2003
⋮
2019
2020

DATA BASE: ARTIL, COMP, LAW, TM075, WEAPON

SUGGESTED OPERATING MODE: BATCH ONLY

PURPOSE: TO CREATE DATA FILES IN FORMAT COMPATIBLE WITH ANALYSIS PACKAGE. ONE TO TWENTY ANALYSIS FILES MAY BE CREATED USING STRINGS FILE1---FILE20. THE OUTPUT OF EACH RETRIEVAL OPERATION IS STORED ON LOGICAL FILES FILE1---FILE20.

USAGE: *FILE1 (ARG1,ARG2)%
OR
*C2001 (ARG1,ARG2)%
⋮
*FILE20 (ARG1,ARG2)%
OR
*C2020 (ARG1,ARG2)%

ARGUMENTS: ARG1 = ONE COMPONENT NUMBER OR NAME OF VARIABLE TO BE RETRIEVED
ARG2 = QUALIFICATIONS ON ARG1 IN WHERE CLAUSE FORMAT.

NOTE: STRING IS LIMITED TO 80 CARD COLUMNS, AND NESTED WHERE CLAUSES ARE NOT ALLOWED

EXAMPLE: ARTIL DATA BASE: *FILE1(LOT,CALIBER EQ 60MM AND TYPE EQ HE)%
CREATES A FILE CALLED FILE1 CONTAINING THE LOT NUMBERS OF ALL 60MM, HE COMPLETE ROUNDS. OR: *FILE(C3, C1 EQ 60 MM AND C2 EQ HE)%

DATA BASE ARTIL

STRING:	SUMMARY
NUMBER:	4000
DATA BASE:	ARTIL
SUGGESTED OPERATING MODE:	BATCH
PURPOSE:	TØ LIST CALIBER, TYPE, LØT NUMBER, M NUMBER, TEST DATE, AND FINAL DISPØSITIØN FØR ALL LØTS. DATA ARE SØRTED BY CALIBER, TYPE, AND LØT NUMBER.
USAGE:	*SUMMARY* % OR *C4000* %

STRING:	DISPLAY
NUMBER:	4005
DATA BASE:	ARTIL
SUGGESTED OPERATING MODES:	BATCH OR INTERACTIVE
PURPOSE:	TO PRINT ALL AVAILABLE DATA FOR GIVEN COMPLETE ROUND LOT NUMBER.
USAGE:	*DISPLAY(ARG1)% OR *C4005(ARG1)%
ARGUMENTS:	ARG1 = COMPLETE ROUND LOT NUMBER
EXAMPLE:	*DISPLAY(HA-014-492)%

SAMPLE OUTPUT:

DISPLAY

```
CALIBER* 60 MM
TYPE* HE
LOT* MA-014-492
M NUMBER* M49A4
QUANTITY*  99579
MANUFACTURER* MILAN
INITIAL DISP* PROV ACCEP
FINAL DISP* PENDING
PROVING GROUND* JEFFERSON
TEST DATE* 02/27/1973
TYPE TEST* FIRST TEST
FIRING RECORD NUMBER* 73-636
ITEM NOMENCLATURE*  M49A4      60 MM      HE

 TEST NAME* ACCEPTANCE
 TEST PHASE* R-A 0 INCR
 REF VS TEST* TEST
 WIND VELOCITY*  24
 TEST REMARKS*

 TUBE NUMBER* NONE

  VEL N*  24
  VEL UNCORR MEAN*    167.00
  VEL STD*    1.50
  VEL MAXIMUM*    169.00
  VEL MINIMUM*    165.00
  RNG N*  24
  RNG MEAN*    249
  RNG STD*    5.1
  RNG MAXIMUM*    256
  DEFL N*  24
  DEFL MEAN* -004.0
  DEFL STD*    1.2

 TEST NAME* ACCEPTANCE
 TEST PHASE* R-A 4 INCR
 REF VS TEST* TEST
 WIND VELOCITY*  24
 TEST REMARKS*

 TUBE NUMBER* NONE

  VEL N*  24
  VEL UNCORR MEAN*    496.00
  VEL STD*    4.60
  VEL MAXIMUM*    507.00
  VEL MINIMUM*    487.00
  PRES N*  24
  PRES MEAN*     34
  PRES MAXIMUM*     37
  PRES MINIMUM*     30
  RNG N*  24
  RNG MEAN*  1796
  RNG STD*  27.5
  RNG MAXIMUM*  1841
  RNG MINIMUM*  1749
  DEFL N*  24
  DEFL MEAN* -056.9
  DEFL STD*    6.2

 EQUIP NAME* WEAPON ONE
 EQUIP LOT* 7260

 EQUIP NAME* WEAPON TWO
```

STRING:	CØMPLØT
NUMBER:	4006
DATA BASE:	ARTIL
SUGGESTED OPERATING MODES:	BATCH OR INTERACTIVE
PURPOSE:	TØ PRINT CØMPØNENT NAME, LØT NUMBER, QUANTITY AND MANUFACTURE DATA FØR GIVEN CØMPLETE RØUND LØT NUMBER.
USAGE:	*COMPLOT(ARG1)% OR *C4006(ARG1)%
ARGUMENTS:	ARG1 = COMPLETE ROUND LOT NUMBER
EXAMPLE:	*COMPLOT(MA-014-492)%

SAMPLE OUTPUT:

```
COMPLOT
CALIBER* 60 MM
TYPE* HE
LOT* MA-014-492
M NUMBER* M49A4
QUANTITY* 99579
MANUFACTURER* MILAN
INITIAL DISP* PROV ACCEP
FINAL DISP* PENDING
PROVING GROUND* JEFFERSON
TEST DATE* 02/27/1973
TYPE TEST* FIRST TEST
FIRING RECORD NUMBER* 73-636
ITEM NOMENCLATURE* M49A4 60 MM HE

COMPONENT NAME* PROPELLANT
COMPONENT LOT* RAL-66666
COMPONENT NAME* PROP LOT2
COMPONENT NAME* FUZE
COMPONENT LOT* MA-025-018
COMPONENT LOT* MA-025-019
COMPONENT NAME* IGN CART
COMPONENT LOT* SGK-010-019
COMPONENT LOT* SGK-010-020
COMPONENT NAME* PROJECTILE
COMPONENT LOT* YCC-002-017
COMPONENT LOT* YCC-002-018
COMPONENT NAME* FIN ASSMBY
COMPONENT LOT* DEL-004-002
COMPONENT NAME* OBTURATOR
COMPONENT NAME* PRIMER
COMPONENT LOT* MA-006-046
COMPONENT LOT* MA-006-047
COMPONENT LOT* MA-006-048
```

STRING:	CSEARCH
NUMBER:	4008
DATA BASE:	ARTIL
SUGGESTED OPERATING MODES:	BATCH OR INTERACTIVE
PURPOSE:	TO LIST, THE COMPLETE ROUND LOT NUMBER, QUANTITY, INITIAL DISPOSITION AND TEST DATE FOR EACH COMPLETE ROUND USING COMPONENTS WITH A GIVEN COMPONENT LOT NUMBER. THE COMPONENT QUANTITY USED IN EACH COMPLETE ROUND LOT IS ALSO LISTED. DATA ARE SORTED BY COMPLETE ROUND LOT NUMBER AND TEST DATE.
USAGE:	*CSEARCH(ARG1)% OR *C4008(ARG1)%
ARGUMENTS:	ARG1 = COMPONENT LOT NUMBER
EXAMPLE:	*CSEARCH(LS-116-018)% RETRIEVES ALL COMPLETE ROUNDS USING FUZE LOT LS-116-018.

SAMPLE OUTPUT:

CSEARCH

LS-116-018
09/18/75

LOT NUMBER	QUANT	CR DISP	DATE	COMPONENT QUANT
**				
LS-067-045	31012	PROV ACCEP	01/26/1973	
LS-067-046	5969	PROV ACCEP	01/26/1973	
LS-067-047	41670	ACCEPTED	02/02/1973	

THIS IS ARTIL

STRING.	HEWPFR
NUMBER:	4040
DATA BASE:	ARTIL
SUGGESTED OPERATING MODE:	BATCH ONLY
PURPOSE:	TO PROVIDE ACCEPTANCE TEST SUMMARY AND DATA CARD INFORMATION FOR ONE USER SELECTED HE OR HP (SMOKE) LOT NUMBER. THE FOLLOWING DATA ARE LISTED: a). GENERAL LOT INFORMATION b). TEST IDENTIFICATION DATA c). TEST SUMMARY DATA d). ROUND BY ROUND DATA e). DATA CARD SUMMARY f). SUPPORT EQUIPMENT SUMMARY g). COMMENT INFORMATION
USAGE:	*HEWPFR(ARG1) % OR *C4040(ARG1) %
ARGUMENTS:	ARG1 = COMPLETE ROUND HE OR HP LOT NUMBER
EXAMPLE:	*HEWPFR(PB-010-026)% LISTS ACCEPTANCE TEST SUMMARY AND DATA CARD INFORMATION FOR 105MM SMOKE LOT PB-010-026.

SAMPLE OUTPUT:

HEWPER - 1

ACCEPTANCE TEST SUMMARY
09/18/75

LOT NUMBER	CALIBER	TYPE	M NUMBER	QUANTITY	MANUFACTURER	INITIAL DISP	FINAL DISP	PROVING GROUND
FH-010-026	105 MM	SMOKE	M60A2	13892	PINE BLUFF	ACCEPTED	ACCEPTED	JEFFERSON

TEST DATE* 02/05/1975
TYPE TEST* FIRST TEST
FIRING RECORD NUMBER* 241
ITEM NOMENCLATURE* CTG, 105MM, SMOKE, WP, M60A2

CAUSE OF REJECTION* NONE

RELATED FIRING RECORD* NONE
CORRECTION* 0 MPS

TEST NAME* ACCEPTANCE	TEST NAME* ACCEPTANCE	TEST NAME* ACCEPTANCE
TEST PHASE* VEL AMB	TEST PHASE* VEL AMB	TEST PHASE* SAFETY
REF VS TEST* REF	REF VS TEST* TEST	REF VS TEST* TEST
DATE FIRED* 02/05/1975	DATE FIRED* 02/05/1975	DATE FIRED* 02/05/1975
APPROX TIME FIRED* 907	APPROX TIME FIRED* 908	APPROX TIME FIRED* 935
AZIMUTH* 335.90	AZIMUTH* 335.90	AZIMUTH* .00
FIRING POSITION* H-13	FIRING POSITION* H-13	FIRING POSITION* H-12
PROP CHG* 7 INCR	PROP CHG* 7 INCR	PROP CHG* EXCESS
TEST REMARKS*	TEST REMARKS*	TEST REMARKS*
VEL N* 6	VEL N* 10	PRES N* 10
VEL UNCORR MEAN* 465.00	VEL UNCORR MEAN* 456.00	PRES MEAN* 433
VEL STD* 3.70	VEL CORR MEAN* 463.00	PRES MAXIMUM* 449
VEL MAXIMUM* 466.00	VEL STD* 1.50	PRES MINIMUM* 424
VEL MINIMUM* 456.00	VEL MAXIMUM* 465.00	DEFL N* 10
DEFL N* 10	VEL MINIMUM* 451.00	DEFL MEAN* 166.0
DEFL MEAN* 260.0	DEFL N* 10	DEFL STD* .0
DEFL STD* .0	DEFL MEAN* 260.0	
	DEFL STD* .0	

SAMPLE OUTPUT:

NEWPFR - 2

ROUND BY ROUND DATA
09/18/75

LOT NUMBER	PHASE	ROUND NUMBER	SAMPLE NUMBER	PROJ FUNC	FUZE ACTION	VEL	RANGE	DEFL	PRES	WEIGHT	REMA
**											
PB-010-026	VEL AMB	1813	1	NONE	INERT			260			
		1815	2	NONE	INERT	468.0		260			
		1817	3	NONE	INERT	467.0		260			
		1819	4	NONE	INERT	466.0		260			
		1821	5	NONE	INERT	466.0		260			
		1823	6	NONE	INERT	466.0		260			
		1825	7	NONE	INERT			260			
		1827	8	NONE	INERT	466.0		260			
		1829	9	NONE	INERT	465.0		260			
		1831	10	NONE	INERT	466.0		260			
SS	VEL AMB	1814	1	SAT	S.G.	458.0		260		34.32	
		1816	2	SAT	S.G.	457.0		260		34.32	
		1818	3	SAT	S.G.	457.0		260		34.33	
		1820	4	SAT	S.G.	456.0		260		34.33	
		1822	5	SAT	S.G.	456.0		260		34.32	
		1824	6	SAT	S.G.	454.0		260		34.36	
		1826	7	SAT	S.G.	454.0		260		34.36	
		1828	8	SAT	S.G.	456.0		260		34.31	
		1830	9	SAT	S.G.	455.0		260		34.28	
		1832	10	SAT	S.G.	454.0		260		34.34	
	SAFETY	4588	11	SAT	S.G.			-166	434		
		4589	12	SAT	S.G.			-166	436		
		4590	13	SAT	S.G.			-166	449		
		4591	14	SAT	S.G.			-166	437		
		4592	15	SAT	S.G.			-166	437		
		4593	16	SAT	S.G.			-166	431		
		4594	17	SAT	S.G.			-166	425		
		4595	18	SAT	S.G.			-166	424		
		4596	19	SAT	S.G.			-166	431		
		4597	20	SAT	S.G.			-166	428		

SAMPLE OUTPUT:

HEWPER - 3

DATA CARD SUMMARY
09/18/75

LOT NUMBER	COMPONENT NAME	COMPONENT LOT	COMPONENT QUANTITY	COMPONENT DATE MANU
**				
PR-010-026				

SUPPORT EQUIPMENT SUMMARY
09/18/75

LOT NUMBER	EQUIP NAME	EQUIP MODEL	EQUIP LOT
**			
PR-010-026	HOW, 105MM	M2A2	18913
	TUBE,105MM	M2A2	67375
	CARRIAGE	M2A2	6567
	RECOIL	M2A5	2370
	HOW, 105MM	M137E1	2052
	TUBE,105MM	M137E1	64648
	CARRIAGE	M31	790
	RECOIL	M37	2638

COMMENTS* ALL VEL CORR TO PROJ WT=33 LB.

COMMENTS* PERCNT LOT DEF= 0.00

STRING:	ILLUMFR
NUMBER:	3000
DATA BASE:	ARTIL
SUGGESTED OPERATING MODE:	BATCH ONLY
PURPOSE:	TO PROVIDE ACCEPTANCE TEST SUMMARY AND DATA CARD INFORMATION FOR ONE USER SELECTED ILLUMINATING LOT NUMBER. THE FOLLOWING DATA ARE LISTED: a). GENERAL LOT INFORMATION b). TEST IDENTIFICATION DATA c). TEST SUMMARY DATA d). ROUND BY ROUND DATA e). DATA CARD SUMMARY f). SUPPORT EQUIPMENT SUMMARY g). COMMENT INFORMATION
USAGE:	*ILLUMFR(ARG1)% OR *C3000(ARG1)%
ARGUMENTS:	ARG1 = COMPLETE ROUND ILLUMINATING LOT NUMBER
EXAMPLE:	*ILLUMFR(LOW-040-015)% LISTS ACCEPTANCE TEST SUMMARY AND DATA CARD INFORMATION FOR IOSMM ILLUMINATING LOT LOW-040-015.

SAMPLE OUTPUT:

ILLMFR - 1

ACCEPTANCE TEST SUMMARY
09/18/75

LOT NUMBER	CALIBER	TYPE	M NUMBER	QUANTITY	MANU-FACTURER	INITIAL DISP
**						
LCW-040-015	105 MM	ILLUM	M314A3	6000	LOUISIANA	ACCEPTED

TEST DATE* 01/30/1975
TYPE TEST* FIRST TEST
FIRING RECORD NUMBER* 75-191
ITEM NOMENCLATURE* CARTRIDGE, 105MM, ILLUM M314A3

CAUSE OF REJECTION* NONE

RELATED FIRING RECORD* NONE
CORRECTION* NONE

TEST NAME* ACCEPTANCE
TEST PHASE* FACT AMB
REF VS TEST* TEST
DATE FIRED* 01/30/1975
APPROX TIME FIRED* 925
AZIMUTH* 1.52
FIRING POSITION* H-13
PROP CHG* 7 INCR
TEST REMARKS* 2 HAD NO ILLUM.

EFFECT ILLUM N* 32
EFFECT ILLUM MAXIMUM* 81.0
EFFECT ILLUM MINIMUM* 55.0
FUZE TIME N* 34
FUZE TIME MEAN* 28.00
FUZE TIME STD* .00
FUZE TIME MAXIMUM* 28.00
FUZE TIME MINIMUM* 28.00
DEFLEC N* 34
DEFLEC MAXIMUM* 15
DEFLEC MINIMUM* 0

TEST NAME* ACCEPTANCE
TEST PHASE* SAFETY
REF VS TEST* TEST
DATE FIRED* 01/30/1975
APPROX TIME FIRED* 1046
AZIMUTH* 1.52
FIRING POSITION* H-13
PROP CHG* EXCESS
TEST REMARKS* NONE

DEFLEC N* 3
DEFLEC MAXIMUM* 35 55
DEFLEC MINIMUM* 35

SAMPLE OUTPUT:

ILLUMFR - 2 LOT NUMBER

ROUND BY ROUND DATA LOW-040-015
09218775

PHASE	ROUND NUMBER	SAMPLE NUMBER	EFFECT ILLUM	BURST FT	HORIZ RANGE	FUZE TIME	CHUTE DELAY	VEL	DEFLEC	DESCENT RATE	PRES	REMAI
FACT ARB	1747	1	65.0			28.00			15			HGB
	1748	2	63.0			28.00			15			
	1749	3	65.0			28.00			15			
	1750	4	76.0			28.00			15			
	1751	5	60.0			28.00			15			IDO
	1752	6	73.0			28.00			15			
	1753	7	66.0			28.00			15			
	1754	8	76.0			28.00			15			
	1755	9	65.0			28.00			15			IDO
	1756	10	60.0			28.00			0			
	1757	11	64.0			28.00			0			
	1758	12	66.0			28.00			0			
	1759	13	72.0			28.00			0			
	1760	14	65.0			28.00			0			
	1761	15	70.0			28.00			0			
	1762	16	70.0			28.00			0			
	1763	17				28.00			0			
	1764	18	74.0			28.00			0			
	1765	19	66.0			28.00			0			
	1766	20	81.0			28.00			0			
	1767	21	71.0			28.00			0			
	1768	22	71.0			28.00			0			
	1769	23	79.0			28.00			0			
	1770	24	66.0			28.00			0			
	1771	25	73.0			28.00			0			
	1772	26	70.0			28.00			0			
	1773	27	68.0			28.00			0			
	1774	28	77.0			28.00			0			
	1775	29	61.0			28.00			0			
	1776	30				28.00			0			
	1777	31	70.0			28.00			0			
	1778	32	55.0			28.00			0			
	1779	33	77.0			28.00			0			
	1780	34	77.0			28.00			0			
SAFETY	1781	35							35		383	
	1782	36							35		393	
	1783	37							35		389	

SAMPLE OUTPUT:

BLUMFR - 3

DATA CARD SUMMARY
09/18/75

LOT NUMBER	COMPONENT NAME	COMPONENT LOT	COMPONENT QUANTITY	COMPONENT DATE MANU
**				
LOW-040-015				

SUPPORT EQUIPMENT SUMMARY
09/18/75

LOT NUMBER	EQUIP NAME	EQUIP MODEL	EQUIP LOT
**			
LOW-040-015	HOW, 105MM	M2A2	18915
	TUBE,105MM	M2A2	67575
	CARRIAGE	M2A2	8567
	RECOIL	M2A5	2370

THIS IS ARTIL

STRING: HEPHEATFR

NUMBER: 3010

DATA BASE: ARTIL

SUGGESTED OPERATING MODE: BATCH ONLY

PURPOSE: TO PROCIDE ACCEPTANCE TEST SUMMARY AND DATA CARD INFORMATION FOR ONE USER SELECTED HEP, HEAT, APDS OR TP LOT NUMBER. THE FOLLOWING DATA ARE LISTED.

a). GENERAL LOT INFORMATION
b). TEST IDENTIFICATION DATA
c). TEST SUMMARY DATA
d). ROUND BY ROUND DATA
e). DATA CARD SUMMARY
f). SUPPORT EQUIPMENT SUMMARY
g). COMMENT INFORMATION

USAGE: *HEPHEATFR(ARG1)%
OR
*C3010(ARG1)%

ARGUMENTS: ARG1 = COMPLETE ROUND HEP, HEAT, APDS OR TP LOT NUMBER

STRING:	ASUM
NUMBER:	4086
DATA BASE:	ARTIL
SUGGESTED OPERATING MODE:	BATCH
PURPOSE:	To provide a summary data list for a group of lots qualified by a legal "where" clause. Data provided for each lot in the group includes lot number, date, disposition, malfunction, velocity, pressure and range data by phase.
USAGE:	*ASUM(ARG1)% OR *C4086(ARG1)%
ARGUMENTS:	ARG1 = A legal where clause to qualify a group of lots
EXAMPLE:	*ASUM(C4 EQ M374A2 AND MEAN VELOCITY GT 850)%

STRING:	BSUM
NUMBER:	4087
DATA BASE:	ARTIL
SUGGESTED OPERATING MODE:	BATCH
PURPOSE:	To provide a summary data list for all lots containing a specific M-number. Data returned includes lot number, date, disposition, malfunction, velocity, pressure and range data by phase ordered by lots.
USAGE:	*BSUM(ARG1)% OR *C4087(ARG1)%
ARGUMENTS:	ARG1 = The M-Number of interest
EXAMPLE:	*BSUM(M374A2)%

STRING	CSUM
NUMBER:	4088
DATA BASE:	ARTIL
SUGGESTED OPERATING MODE:	INTERACTIVE
PURPOSE:	To provide a summary data list for all lots of a particular caliber and type for a specific time period. Data provided includes lot number, date, disposition, malfunction, pressure, velocity and range data by phase.
USAGE:	*CSUM(ARG1,ARG2,ARG3,ARG4)% OR *C4088(ARG1,ARG2,ARG3,ARG4)%
ARGUMENTS:	ARG1 = CALIBER (105 MM or 4.2 INCH) ARG2 = TYPE (HE, WP, ILLUM, HEP) ARG3 = INITIAL SEARCH DATE MM/DD/YY ARG4 = FINAL SEARCH DATE MM/DD/YY
EXAMPLE:	*CSUM(81MM,HE,01/01/74,01/31/74)% LISTS SPECIFIED DATA FOR ALL 81MM HE ROUNDS FOR JANUARY 1974.

SAMPLE OUTPUT:

CSUM

ACCEPTANCE TEST SUMMARY
09/18/75

LOTNUMBER	TEST DATE	STATUS	PHASE	MALFUNCTIONS
**				
AGY-500-009	01/15/1974		R-A 0 INCR	
LS-067-108	01/04/1974	ACCEPTED	R-A 1 INCR	1 RD MAJOR-NULL-
			R-A 9 INCR	NONE
LS-067-109	01/10/1974	ACCEPTED	R-A 1 INCR	NONE
			R-A 9 INCR	3 RD MAJOR-NULL-
LS-067-110	01/16/1974	ACCEPTED	R-A 1 INCR	NONE
			R-A 9 INCR	NONE
LS-067-111	01/24/1974	ACCEPTED	R-A 1 INCR	NONE
			R-A 9 INCR	1 MISFIRE -NULL-
LS-067-112	01/31/1974	ACCEPTED	R-A 1 INCR	NONE
			R-A 9 INCR	NONE
MA-007-0280	01/22/1974		R-A 0 INCR	
			VEL+70	
			RANGE-ACC	
MA-136-096	01/04/1974	ACCEPTED	R-A 1 INCR	NONE
			R-A 9 INCR	1 RD MAJOR-NULL-
MA-136-099	01/22/1974	ACCEPTED	R-A 1 INCR	NONE
			R-A 9 INCR	NONE
MA-136-100	01/31/1974	ACCEPTED	R-A 9 INCR	NONE
			R-A 1 INCR	NONE

MEAN VEL	S.D. VEL	MEAN PRESS	MAX PRESS	MEAN RANGE	S.D. RANGE
347.00	2.20			1025	13.4
872.00	2.00	75	81	4613	39.7
347.00	1.60			1034	11.7
873.00	2.70	80	82	4746	29.3
350.00	2.30			1040	12.8
873.00	1.80	79	82	4695	40.4
345.00	1.80			980	8.4
865.00	2.70	75	77	4279	37.1
348.00	1.60			1026	8.2
866.00	2.50	77	79	4324	37.9
347.00	2.20			1023	12.9
868.00	1.80	80	82	4568	41.7
352.00	2.30			1035	13.7
862.00	3.10	77	78	4485	33.3
865.00	2.50	77	79	4298	30.5
349.00	1.80			1023	10.5

STRING:	CROSS
NUMBER:	4090
DATA BASE:	ARTIL
SUGGESTED OPERATING MODE:	INTERACTIVE
PURPOSE:	To obtain a listing of ballistic test results for a complete round lot and the fuze and propellant lots associated with it. The listing is on a local file named CROSS. This string is normally used immediately preceeding C4091*ACROSS. CROSS must be batched to a line printer. (BATCH,CROSS,PRINT,AM,AXXX).
USAGE:	*CROSS(ARG1)% OR *C4090(ARG1)%
ARGUMENTS:	ARG1 = Complete round lot number
EXAMPLE:	*CROSS(MA-136-073)%

STRING:	ACROSS
NUMBER:	4091
DATA BASE:	ARTIL
SUGGESTED OPERATING MODE:	INTERACTIVE
PURPOSE:	To obtain a listing of ballistic test results for a complete round lot and the fuze and propellant lots associated with it. This string is normally used after string C4090*CROSS which will display the propellant and fuze lot numbers on the TTY. Data is listed on a local file named CROS. CROS must be batched to a line printer.
USAGE:	*ACROSS(ARG1,ARG2)% OR *C4091(ARG1,ARG2)% EXIT% BATCH,CROS,PRINT,HERE,BM.
ARGUMENTS:	ARG1 = Propellant lot number ARG2 = Fuze lot number
EXAMPLE:	*ACROSS(CIL-68518,MA-071-028)%

STRING:	TALLY
NUMBER:	4030
DATA BASE:	ARTIL
SUGGESTED OPERATING MODE:	BATCH OR INTERACTIVE
PURPOSE:	TO TALLY FREQUENCY OF OCCURRENCE IN DATA BASE OF EACH CALIBER, TYPE AND M NUMBER.
USAGE:	*TALLY*%
	OR
	C4030%

SAMPLE OUTPUT:

TALLY

ELEMENT- CALIBER	
FREQUENCY	VALUE
1	HELP
730	105 MM
47	106 MM
17	152 MM
414	40 MM
54	4.2 IN
44	57 MM
545	66 MM
468	81 MM
1	90 MM
10	UNIQUE VALUES
2321	OCCURRENCES

ELEMENT- TYPE	
FREQUENCY	VALUE
39	AMDS-T
14	APERS
1	AP-T
2	BLANK
184	HE
73	HE W/FM551
69	HEAT
23	HEAT-FS
136	HEDP /M550
24	HEF
86	HEP-T
572	ILLUM
9	MONT
8	SMK WP
198	SMOKE
2	TP
13	TPDS-T
86	TP-T
122	WS
19	UNIQUE VALUES
2281	OCCURRENCES

ELEMENT- M NUMBER	
FREQUENCY	VALUE
219	M1
11	M1A1
19	M242
171	M301A3
31	M302A1
7	M306A1
37	M307A1
143	M314A3
1	M316
1	M329A1
55	M335A2
23	M344A1
24	M346A1
207	M374A2
80	M375A2
61	M383
39	M392A2
76	M393A2
2	M395
73	M406
22	M407A1
17	M411A3
6	M43A1
136	M433
39	M456A1
286	M459A4
65	M490
10	M494
122	M583A1
95	M60A2
4	M67
10	M724A1
13	M724E1
230	M83A3
4	XM546
35	UNIQUE VALUES
2339	OCCURRENCES

STRING:	TYPESUM
NUMBER:	4050
DATA BASE:	ARTIL
SUGGESTED OPERATING MODE:	BATCH
PURPOSE:	TO LIST CALIBER, TYPE, LOT NUMBER, M NUMBER, TEST DATE AND FINAL DISPOSITION FOR ALL LOTS OF GIVEN TYPE. DATA ARE SORTED BY CALIBER, TYPE AND LOT NUMBER.
USAGE:	*TYPESUM(ARG1)% OR *C4050(ARG1)%
ARGUMENTS:	ARG1 = ITEM TYPE
EXAMPLE:	*TYPESUM(HE)%
ARGUMENT SUMMARY:	ARG1 - HE ILLUM SMOKE

STRING:	CALSUM
NUMBER:	4051
DATA BASE:	ARTIL
SUGGESTED OPERATING MODE:	BATCH
PURPOSE:	TO LIST CALIBER, TYPE, LOT NUMBER, M NUMBER, TEST DATE, AND FINAL DISPOSITION FOR ALL LOTS OF GIVEN CALIBER. DATA ARE SORTED BY TYPE AND LOT NUMBER.
USAGE:	*CALSUM(ARG1)% OR *C4051(ARG1)%
ARGUMENTS:	ARG1 = CALIBER
EXAMPLE:	*CALSUM(105MM)%
ARGUMENT SUMMARY:	ARG1 = 4.2 IN 60 MM 81 MM 105 MM etc.

STRING:	CALTYPE
NUMBER:	4052
DATA BASE:	ARTIL
SUGGESTED OPERATING MODE:	BATCH
PURPOSE:	TO LIST CALIBER, TYPE, LOT NUMBER, M NUMBER, TEST DATE, AND FINAL DISPOSITION FOR ALL LOTS OF GIVEN CALIBER AND TYPE. DATA ARE SORTED BY CALIBER, TYPE AND LOT NUMBER.
USAGE:	*CALTYPE(ARG1,ARG2)$ OR *C4052(ARG1,ARG2)$
ARGUMENTS:	ARG1 = CALIBER ARG2 = ITEM TYPE
EXAMPLE:	*CALTYPE(105MM,HE)$
ARGUMENT SUMMARY:	ARG1 = 4.2 IN 60 MM 81 MM 105 MM ARG2 = HE SMOKE ILLUM

STRING:	DATACARD
NUMBER:	4060
DATA BASE:	ARTIL
SUGGESTED OPERATING MODE:	BATCH
PURPOSE:	TO LIST CALIBER, TYPE, LOT NUMBER, M NUMBER, TEST DATE AND FINAL DISPOSITION FOR ALL LOTS HAVING DATA CARD INFORMATION. DATA ARE SORTED BY CALIBER, TYPE AND LOT NUMBER.
USACL:	*DATA CARD*$ OR *C4060*$

STRING:	NODATACARD
NUMBER:	4061
DATA BASE:	ARTIL
SUGGESTED OPERATING MODE:	BATCH
PURPOSE:	TO LIST CALIBER, TYPE, LOT NUMBER, M NUMBER, TEST DATE AND FINAL DISPOSITION FOR ALL LOTS MISSING DATA CARD INFORMATION. DATA ARE SORTED BY CALIBER, TYPE AND LOT NUMBER.
USAGE:	*NO DATACARD*$ OR *C4061*$

STRING:	DISPOSITION
NUMBER:	4070
DATA BASE:	ARTIL
SUGGESTED OPERATING MODE:	BATCH
PURPOSE:	TO PROVIDE SUMMARY LISTING OF CLAIBER, TYPE, LOT NUMBER, M NUMBER, TEST DATE AND FINAL DISPOSITION OF ALL LOTS WITH GIVEN FINAL DISPOSITION. DATA ARE SORTED BY CALIBER, TYPE AND LOT NUMBER.
USAGE:	*DISPOSITION(ARG1)$ OR *C4070(ARG1)$
ARGUMENTS:	ARG1 - LOT DISPOSITION
EXAMPLE:	*DISPOSITION(REJECTED)$
ARGUMENT SUMMARY:	ARG1 = ACCEPTED REJECTED PENDING

STRING:	DATESUM
NUMBER:	4080
DATA BASE:	ARTIL
SUGGESTED OPERATING MODE:	BATCH
PURPOSE:	TO LIST CALIBER, TYPE, LOT NUMBER, M NUMBER, TEST DATE, AND FINAL DISPOSITION FOR ALL LOTS BETWEEN TWO TEST DATES. DATA ARE SORTED BY TEST DATE, CALIBER, TYPE AND LOT NUMBER.
USAGE:	*DATESUM(ARG1,ARG2)% OR *C4080(ARG1,ARG2)%
ARGUMENTS:	ARG1 = START TEST DATE MM/DD/YY ARG2 = END TEST DATE MM/DD/YY
EXAMPLE:	*DATESUM(03/01/74, 03/31/74)% ALL DATA FOR MARCH 1974 SUMMARIZED

DATA BASE COMP

STRING:	SUMMARY
NUMBER:	4000
DATA BASE:	COMP
SUGGESTED OPERATING MODE:	BATCH
PURPOSE:	TO LIST TYPE, LOT NUMBER, M NUMBER, TEST DATE, AND FINAL DISPOSITION FOR ALL LOTS. DATA ASSORTED BY TYPE, LOT NUMBER AND M NUMBER.
USAGE:	*SUMMARY*$ OR *C4000*$

STRING: PROP

NUMBER: 4040

DATA BASE: COMP

SUGGESTED OPERATING MODE: BATCH ONLY

PURPOSE: TO PROVIDE ACCEPTANCE, TEST SUMMARY, AND PROPELLANT DESCRIPTION SHEET DATA FOR USER SELECTED PROPELLANT LOT NUMBER. THE FOLLOWING DATA ARE LISTED.

a). GENERAL LOT INFORMATION
b). MEASURED CHARACTERISTICS
c). RECOMMENDED CHARGE DATA
d). DIMENSION DATA
e). SUPPORT EQUIPMENT SUMMARY

USAGE: *PROP(ARG1)%
OR
*C4040(ARG1)%

ARGUMENTS: ARG1 = PROPELLANT LOT NUMBER

EXAMPLE: *PROP(CIL-69090)%

LISTS ACCEPTANCE TEST SUMMARY AND PROPELLANT DESCRIPTION FOR PROPELLANT LOT CIL-69090.

STRING:	FUZE
NUMBER:	4060
DATA BASE:	COMP
SUGGESTED OPERATING MODE:	BATCH ONLY
PURPOSE:	TO PROVIDE ACCEPTANCE TEST SUMMARY, DATA CARD SUMMARY AND COMPONENT FAILURE SUMMARY FOR ONE USER SELECTED FUZE LOT NUMBER. THE FOLLOWING DATA ARE LISTED: a). GENERAL LOT INFORMATION b). TEST IDENTIFICATION DATA c). TEST MEASUREMENT SUMMARY d). FUZE DATA CARD SUMMARY e). FUZE COMPONENT FAILURE SUMMARY f). COMMENT INFORMATION
USAGE:	*FUZE(ARG1)% OR *C4060(ARG1)%
ARGUMENTS:	ARG1 = FUZE LOT NUMBER
EXAMPLE:	*FUZE(MA-071-015)% LISTS ACCEPTANCE TEST SUMMARY DATA CARD SUMMARY AND COMPONENT FAILURE SUMMARY FOR M524A6 FUZE LOT MO-071-015.

STRING:	IGNCART
NUMBER:	4070
DATA BASE:	COMP
SUGGESTED OPERATING MODE:	BATCH ONLY
PURPOSE:	TO PROVIDE ACCEPTANCE TEST SUMMARY FOR ONE IGNITION CARTRIDGE LOT NUMBER. THE FOLLOWING DATA ARE LISTED: a). GENERAL LOT INFORMATION b). TEST IDENTIFICATION AND MEASUREMENT SUMMARY c). COMMENT INFORMATION
USAGE:	*IGNCART(ARG1)% OR *C4070(ARG1)%
ARGUMENTS:	ARG1 - IGNITION CARTRIDGE LOT NUMBER
EXAMPLE:	*IGNCART(SGK-003-052)% LISTS ACCEPTANCE TEST SUMMARY FOR 1285 IGNITION CARTRIDGE LOT SGK-003-053.

STRING:	TALLY
NUMBER:	4030
DATA BASE:	COMP
SUGGESTED OPERATING MODE:	BATCH OR INTERACTIVE
PURPOSE:	TO TALLY FREQUENCY OF OCCURRENCE IN DATA BASE OF EACH CALIBER, TYPE AND M NUMBER.
USAGE:	*TALLY*$ OR *C4030*$

STRING:	TYPESUM
NUMBER:	4050
DATA BASE:	COMP
SUGGESTED OPERATING MODE:	BATCH
PURPOSE:	TO LIST TYPE, LOT NUMBER, M NUMBER, TEST DATE AND FINAL DISPOSITION FOR ALL LOTS OF SPECIFIED TYPE. DATA IS SORTED BY LOT NUMBER AND M NUMBER.
USAGE:	*TYPESUM(ARG1)% OR *C4050(ARG1)%
ARGUMENTS:	ARG1 = ITEM TYPE
EXAMPLE:	*TYPESUM(FUZE)%
ARGUMENT SUMMARY:	ARG1 = FUZE HEAD ASMBY IGN CART PROPELLANT

DATA BASE LAW

DATA BASE TW075

DATA BASE WEAPON

STRING: SUMMARY

NUMBER: 4000

DATA BASE: WEAPON

SUGGESTED OPERATING MODE: BATCH

PURPOSE: TO LIST CALIBER, MODEL NUMBER, TUBE NUMBER, GUN NUMBER AND ROUNDS FIRED FOR ALL TUBE AND GUN NUMBERS. DATA ARE SORTED BY CALIBER, MODEL NUMBER, TUBE NUMBER, GUN NUMBER AND ROUNDS FIRED.

USAGE: *SUMMARY*

OR

C4000

STRING:	RIFLED
NUMBER:	4010
DATA BASE:	WEAPON
SUGGESTED OPERATING MODE:	BATCH ONLY
PURPOSE:	TO LIST STARGAGE INSPECTION DATA FOR RIFLED WEAPONS WITH USER SELECTED TUBE NUMBER AND GUN NUMBER. THE FOLLOWING INFORMATION IS LISTED: a). GENERAL GUN/TUBE INFORMATION b). TUBE MEASUREMENT DATA c). PULLOVER MEASUREMENT DATA d). CHAMBER MEASUREMENT DATA
USAGE:	*RIFLED(ARG1,ARG2)% OR *C4010(ARG1,ARG2)%
ARGUMENTS:	ARG1 = TUBE NUMBER ARG2 = GUN NUMBER
EXAMPLE:	*RIFLED(5620,2100)% LISTS RIFLED WEAPON DATA FOR TUBE 5620, GUN 2100

STRING:	SMOOTH
NUMBER:	4320
DATA BASE:	WEAPON
SUGGESTED OPERATING MODE:	BATCH ONLY
PURPOSE:	TO LIST STARGAGE INSPECTION DATA FOR SMOOTH BORE WEAPONS WITH USER SELECTED TUBE NUMBER AND GUN NUMBER. THE FOLLOWING INFORMATION IS LISTED: a). GENERAL GUN/TUBE INFORMATION b). SMOOTH BORE MUZZLE DATA
USAGE:	*SMOOTH(ARG1,ARG2)% OR *C4020(ARG1,ARG2)%
ARGUMENTS:	ARG1 = TUBE NUMBER ARG2 = GUN NUMBER
EXAMPLE:	*SMOOTH(5116,1124)% LISTS SMOOTH BORE DATA FOR TUBE 5116, GUN 1124

DATA BASE METEO

STRING:	SUMMARY
NUMBER:	4000
DATA BASE:	METEO
SUGGESTED OPERATING MODE:	BATCH ONLY
PURPOSE:	TO LIST DATE, PROVING GROUND, RELATED FIRING RECORD, TIME, WIND DIRECTION, MINIMUM WIND VELOCITY, MAXIMUM WIND VELOCITY, BAROMETRIC PRESSURE, TEMPERATURE, AIR DENSITY, PRECIPITATION AND CEILING FOR USER SELECTED DAYS AND PROVING GROUND. DATA ARE SORTED BY DATE, PROVING GROUND, AND TIME.
USAGE:	*SUMMARY(ARG1,ARG2,ARG3)$ OR *C4000(ARG1,ARG2,ARG3)$
ARGUMENTS:	ARG1 = START DATE M1/DD/YY ARG2 = END DATE M1/DD/YY ARG3 = PROVING GROUND
EXAMPLE:	*SUMMARY(01/01/75,01/31/75,JEFFERSON)$ LIST METEOROLOGICAL INFORMATION FOR 1 JANUARY 1975 TO 31 JANUARY 1975 AT JEFFERSON PROVING GROUND.

DATA BASE CHECK

STRING:	SUMMARY
NUMBER:	4000
DATA BASE:	CHECK
SUGGESTED OPERATING MODE:	BATCH
PURPOSE:	TO PROVIDE SUMMARY LISTING OF CHECK DATA BASE INFORMATION. DATA PRINTED INCLUDES FOR

1). NUMERIC VARIABLES WITH MAX/MIN BOUNDS
   a). DATA BASE NAME
   b). COMPONENT NUMBER
   c). ELEMENT NAME
   d). SCHEMA NUMBER
   e). WORD BOUNDARY WITHIN SCHEMA
   f). MINIMUM PERMISSIBLE VALUE
   g). MAXIMUM PERMISSIBLE VALUE

2). ALPHANUMERIC VARIABLES WITH EXACT COMPARE VALUES
   a). DATA BASE NAME
   b). COMPONENT NUMBER
   c). ELEMENT NAME
   d). SCHEMA NUMBER
   e). WORD BOUNDARY
   f). PERMISSIBLE EXACT COMPARE VALUES

3). NUMERIC/ALPHANUMERIC VARIABLES NOT CHECKED
   a). DATA BASE NAME
   b). COMPONENT NUMBER
   c). ELEMENT NAME
   d). SCHE[illegible]ER
   e). WORL[illegible]RY WITHIN SCHEMA

DATA ARE SORTED BY DATA BASE NAME, SCHEMA NUMBER AND WORD BOUNDARY.

USAGE: *SUMMARY*$

OR

C4000$

STRING: NUMERIC

NUMBER: 4001

DATA BASE: CHECK

SUGGESTED OPERATING MODE: BATCH

PURPOSE: TO PROVIDE SUMMARY LISTING OF NUMERIC VARIABLES SUBJECTED TO MAX/MIN LIMIT CHECKS. THE FOLLOWING INFORMATION IS LISTED.

a). DATA BASE NAME
b). COMPONENT NUMBER
c). ELEMENT NAME
d). SCHEMA NUMBER
e). WORD BOUNDARY WITHIN SCHEMA
f). MINIMUM PERMISSIBLE VALUE
g). MAXIMUM PERMISSIBLE VALUE

DATA ARE SORTED BY DATA BASE NAME, SCHEMA AND WORD BOUNDARY.

USAGE: *NUMERIC* $

OR

C4001 $

STRING:	ALPHA
NUMBER:	4002
DATA BASE:	CHECK
SUGGESTED OPERATING MODE:	BATCH
PURPOSE:	TO PROVIDE SUMMARY LISTING OF ALPHANUMERIC VARIABLES SUBJECTED TO EXACT COMPARE CHECKS. THE FOLLOWING INFORMATION IS LISTED. a). DATA BASE NAME b). COMPONENT NUMBER c). ELEMENT NAME d). SCHEMA NUMBER e). WORD BOUNDARY WITHIN SCHEMA f). PERMISSIBLE EXACT COMPARE VALUES DATA ARE SORTED BY DATA BASE NAME, SCHEMA NUMBER AND WORD BOUNDARY.
USAGE:	*ALPHA*% OR *C4002*%

STRING: NOLIMITS

NUMBER: 4003

DATA BASE: CHECK

SUGGESTED OPERATING MODE: BATCH

PURPOSE: TO PROVIDE SUMMARY LISTING OF CHECK DATA BASE NUMERIC AND ALPHANUMERIC VARAIBLES NOT SUBJECT TO LIMIT OR EXACT COMPARE CHECKS. THE FOLLOWING INFORMATION IS LISTED.

a). DATA BASE NAME
b). COMPONENT NUMBER
c). ELEMENT NAME
d). SCHEMA NUMBER
e). WORD BOUNDARY WITHIN SCHEMA

DATA ARE SORTED BY DATA BASE NAME, SCHEMA NUMBER AND WORD BOUNDARY.

USAGE: *NOLIMITS*%

OR

C4003%

APPENDIX B

Routine Number	Routine Name	Page Number
0	COMMENT	95
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ROUTINE NO.: 0

ROUTINE NAME: COMMENT

PURPOSE: To provide capability of user inserted comments in ARIES input stream.

USAGE: ΔS COMMENT < User TEXT > S

OR

C < User Text >

↑
Col. 1

ROUTINE NO.: 1

ROUTINE NAME: OUTPUT

PURPOSE: To provide capability of user modification of ARIES IO and program termination procedures.

USAGE: Δ $OUTPUT < PARAMETERS > $

PARAMETERS:

LIST DATA FILE LIST Indicator

= 0 (Default)
Do not provide list of input files

= 1 provide list of user data files (Data in first 10 files listed)

ROUTINE NO.: 2

ROUTINE NAME: BASIC

PURPOSE: To compute basic statistical parameters for user selected input data. Statistical output includes:

Number of Observations
Mean Values
Standard Deviations
Variance Covariance Matrix
Correlation Matrix

Using option "IOVER" the user may optionally request the following additional tests to be performed on each input data file.

1. CHISQ Goodness of Fit for Normal Distribution
2. 1-Way Analysis of Variance (GE 2 input groups)
3. Pooled Mean and Variance Estimate (GE 2 input groups)
4. T-test for difference in means (2 input groups)
5. F-test for difference in Variance (2 input groups)
6. Bartletts test for homogeneity of Variance (GE 2 input groups).

USAGE: Δ $ BASIC < PARAMETERS > $

PARAMETERS:

LIST Data File List Indicator

= 0 (Default)
Do not provide list of data files
= 1 Provide list of user data files (active)

I1 Data File Inclusion Indicator

= 0 (Default)
First input file undefined
= k File number k contains data for first variable in analysis

I2 Additional Data File Inclusion Indicators
I3 = 0 (Default)
I4 2nd to 10th analysis variables undefined
I5 = k File number k contains data for 2nd to 10th
I6 variables in analysis
I7
I8
I9
I10

IOVER Failsafe Indicator
IOVER = 0 Do not perform data check
IOVER = 1 F-test (No override) 2 input groups
IOVER = 2 Bartletts Test (No override) 2 or more input groups
IOVER = 3 T-test (No override) 2 input groups
IOVER = 4 Pooled mean and variance (No override 2 or more input groups
IOVER = 5 1-way ANOVA (No override) 2 or more input groups

To override failsafe checks add 10 to IOVER, e.g. IOVER=11 performs F-test with override

If override not indicated, program does not output user requested test results if following assumptions are not met:

Test	Assumption
F	Each sample comes from normally distributed population. Test each sample for normality at $\alpha = 0.95$ using CHISQ goodness of fit test.
Bartlett	Same as above
t-test	Same as above
Sp^2	The sample variances must be homogeneous. Use Bartlet-'s test to decide significance at $\alpha = 0.95$.
ANOVA 1-Way	Same as Sp^2.

Computational Procedure

Let X_i = vector of observations for i^{th} sample
N = number of samples

then:

The maximum likelihood of the centroid or mean value is an unbiased estimator and is given by the column vector m-

$$m = \frac{1}{N} \sum_{i=1}^{N} X_i$$

The maximum likelihood estimator D of the dispersion or variance covariance matrix is

$$D = \frac{1}{N} \sum_{i=1}^{N} (X_i - m)(X_i - m)'$$

or computationally

$$D = \frac{1}{N} \left[\sum_{i=1}^{N} X_i X_i' \right] - m m'$$

The standard deviations are obtained by taking the square root of the diagonal elements of D.

The elements of the maximum likelihood estimator of the correlation matrix R are computable from the variance covariance matrix D as

$$r_{jk} = \frac{d_{jk}}{\sqrt{d_{jj}\, d_{kk}}}$$

ROUTINE NO.: 3

ROUTINE NAME: MREG

PURPOSE: To perform a multiple regression analysis on one dependent variable and from one to five independent variables.

USAGE: Δ $ MREG < PARAMETERS > $

PARAMETERS:

MREG parameters are same as those used for SREG except:

FLEV has no function in MREG

Computational Procedure

Consider the 2 variable regression model

$$Y = B_0 + B_1 Z_1 + B_2 Z_2 + E$$

where B_0, B_1, and B_2 are referred to as the raw regression weights and Z_1, and Z_2 are the unscaled input data.

Let S be the sum of squares and cross product matrix computed as follows

$$S = \begin{bmatrix} S_{11} & S_{12} \\ S_{21} & S_{22} \end{bmatrix}$$

$$S_{jl} = \sum_{i=1}^{N} \left(Z_{ji} - \bar{Z}_j \right)\left(Z_{li} - \bar{Z}_l \right) \qquad j, l = 1, 2$$

The data can be transformed as follows

$$X_{ji} = \frac{(Z_{ji} - \bar{Z}_j)}{S_{jj}^{1/2}} \qquad y_i = \frac{(Y_i - \bar{Y})}{S_{yy}^{1/2}}$$

where

$$S_{yy} = \sum_{i=1}^{N} (Y_i - \bar{Y})^2$$

The regression equation then becomes

$$y = \alpha_1 X_1 + \alpha_2 X_2 + \epsilon$$

where

$$\alpha_i = B_i \left(\frac{S_{ii}}{S_{yy}} \right)^{1/2}$$

The correlation matrix of the Z's is

$$r_{12} = \frac{S_{12}}{(S_{11} S_{22})^{1/2}} = r_{21}$$

The correlation between Z_i and Y is written

$$r_{jy} = \frac{S_{jy}}{(S_{jj} S_{yy})^{1/2}}$$

where

$$S_{jy} = \sum_{i=1}^{N} (Z_{ji} - \bar{Z}_j)(Y_i - \bar{Y})$$

letting a_1, a_2 be the least squares estimates of α_1, α_2 the normal equations for the regression become

$$\begin{bmatrix} 1 & r_{12} \\ r_{21} & 1 \end{bmatrix} \begin{bmatrix} a_1 \\ a_2 \end{bmatrix} = \begin{bmatrix} r_{1y} \\ r_{2y} \end{bmatrix}$$

therefore

$$a_1 = \frac{(r_{1y} - r_{12} r_{2y})}{D}$$

$$a_2 = \frac{(r_{2y} - r_{12} r_{1y})}{D}$$

where $D = (1 - r_{12}^2)$ = the determinant of the correlation matrix.

The raw regression weights B_0, B_1, B_2 can be estimated as follows

$$B_1 = a_1 \left(\frac{S_{yy}}{S_{11}}\right)^{1/2}$$

$$B_2 = a_2 \left(\frac{S_{yy}}{S_{22}}\right)^{1/2}$$

$$B_0 = \bar{Y} - B_1 \bar{Z}_1 - B_2 \bar{Z}_2$$

CautionIn computing the values of a_1 and a_2 above one must divide by $D = 1 - r_{12}^2$, the determinant of the correlation matrix. As a result when r_{12}^2 approaches 1, D is nearly zero (collinearity) and the solution to a_1 and a_2 becomes indeterminate. In the above situation, the two variables represent in fact the only 1 independent equation.

ROUTINE NO.: 4

ROUTINE NAME: SREG

PURPOSE: To perform a stepwise regression analysis on one dependent variable and from one to five independent variables.

USAGE: Δ$ SREG < PARAMETERS > $

PARAMETERS:

LIST Data File List Indicator
= 0 (Default)
Do not provide list of input files used in regression
= 1 Provide list of input files used in regression

IDEP DEPENDENT Variable Indicator
= 0 (Default)
Dependent Variable undefined
= k File number k contains dependent variable

IND1 Independent Variable Indicator
= 0 (Default)
1st Independent Variable undefined
= k File number k contains 1st independent variable

IND2
IND3
IND4
IND5 Additional Independent Variable Indicator
= 0 (Default)
2nd - 5th Independent variables undefined
= k File number k contains 2nd - 5th Independent variables

FLEV Tolerance Level
= .00001 (Default)
= x Tolerance level is x

IRES Pesidual Print Indicator
= 0 (Default)
Do not print residuals
= 1 Print residuals

IPLT — Regression Data Plot Indicator

= 0 (Default)
Do not plot independent variables versus dependent variable

= 1 Plot Data

ITRAN1 — IND1 Transgeneration Code

= 0 (Default) Do not transgenerate file IND1

= k Transgenerate file IND1 using transgeneration k and transgeneration constant RTRAN1. (See computations procedures below).

RTRAN1 — IND1 Transgeneration Constant

= 0 (Default) Transgeneration constant = 0.

= X Transgeneration constant for file IND1 = X. (See restrictions in computational procedures below).

Transgeneration Codes for

ITRAN2	IND2
ITRAN3	IND3
ITRAN4	IND4
ITRAN5	IND5

Transgeneration Constants for

RTRAN2	IND2
RTRAN3	IND3
RTRAN4	IND4
RTRAN5	IND5

COMPUTATIONAL PROCEDURE:

Definition of Transgeneration Codes:

Let:

C = RTRAN
X = Variable before transgeneration

ITRAN	Transgeneration	Restrictions
1	$x \rightarrow \sqrt{x}$	$x \geq 0.$
2	$x \rightarrow \log_{10}(x)$	$x > 0.$
3	$x \rightarrow \log_e(x)$	$x > 0.$
4	$x \rightarrow e^x$	---
5	$x \rightarrow 1/x$	$x \neq 0.$
6	$x \rightarrow x + c$	---
7	$x \rightarrow cx$	---
8	$x \rightarrow x^c$	$x \geq 0.$
9	$x \rightarrow \sin(x)$	---
10	$x \rightarrow \cos(x)$	---
11	$x \rightarrow c^x$	$c > 0.$
12	If $x \geq c$ $x \rightarrow 1$ o.w. $x \rightarrow 0$	---

Computational Procedure

Stepwise regression can be used in data analysis to obtain the best fit in a least squares sense of a set of observations of independent and dependent variables by an equation of the form:

$$y = b_o + b_1 x_1 + b_2 x_2 + \ldots b_N x_N$$

where y is the dependent variable;
$x_1, x_2 \ldots x_n$ are the independent variables;
$b_o, b_1 \ldots b_n$ are the coefficients to be determined

In the stepwise procedure outlined below, several intermediate regression equations are formulated by adding one variable at a time to the regression.

The variable added is that one which makes the greatest improvement in "goodness of fit." The coefficients represent the best values when the equation is fitted by the specific variables included in the equation.

An important property of the stepwise procedure is based on the facts that (a) a variable may be indicated to be significant in any early stage and thus enter the equation, and (b) after several other variables are added to the regression equation, the initial variable may be indicated to be insignificant. The insignificant variable will be removed from the regression equation before adding an additional variable. Therefore, only significant variables are included in the final regression.

The criterion used to select the x_i variable to add (or remove) from the regression is as follows:

1. If the variance contribution of a variable in the regression is insignificant at a specified F-level, this variable is removed. If no variable is to be removed then the following criterion is used.

2. If the variance reduction obtained by adding a variable to the regression is significant at a specified F-level, this variance is entered.

ROUTINE NO.: 5

ROUTINE NAME: LOTPLT

PURPOSE: To plot from one to three variables versus lot number.

USAGE: Δ$LOTPLT ⟨PARAMETERS ⟩ $

PARAMETERS:

IDEP Lot File Indicator

= 0 (Default) File containing lot numbers is undefined

= k File number k contains lot numbers

IND1 Variable Number 1 Indicator

= 0 (Default) 1st variable undefined. ***ERRØR***

= k File k contains 1st variable

IND2 Variable Number 2 Indicator

= 0 (Default) 2nd variable undefined

= k File k contains 2nd variable

IND3 Variable Number 3 Indicator

= 0 (Default) 3rd variable undefined

= k File k contains 3rd variable

YMIN Y Axis (IND1,IND2,IND3) Minimum

= -99. (Default) Program scales data

= X User provided minimum value for Y axis

YMAX Y Axis (IND1,IND2,IND3) Maximum

= -99. (Default) Program scales data

= X User provided maximum value for Y axis.

YBAR1 Y Axis Control Limit Minimum

= -99. (Default) No control line printed

= X Constant line printed at Y = X

YBAR2 Y Axis Control Limit Maximum

= -99. (Default) No control line printed

= X Constant line printed at Y = X

RESTRICTIONS:

1. If only 1 variable plotted IND1 used
2. If only 2 variables plotted IND1,IND2 used
3. If YMIN ≠ -99., YMAX ≠ -99.
4. If YBAR1 ≠ -99., YBAR2 ≠ -99.
5. A maximum of 1024 data points may be plotted for each variable.

ROUTINE NO.: 6

ROUTINE NAME: PLØT

PURPOSE: To provide printer plot of one dependent variable versus from one to five independent variables. Routine has provisions for user input of axis scaling and plot dimensions.

USAGE: △$PLOT <PARAMETERS> $

PARAMETERS:

IDEP — Dependent Variable Indicator

= 0 (Default)
Dependent Variable undefined
= k File number k contains dependent variable

IND1 — Independent Variable Indicator No. 1

= 0 (Default)
1st independent variable undefined
= k File number k contains 1st independent variable

IND2
IND3
IND4
IND5 — Additional Independent Variable Indicators

= 0 (Default)
2nd - 5th Independent Variables undefined
= k File number k contains 2nd-5th independent variables.

LENX — X axis (Dependent Variable) Length Indicator

= 120 lines (Default)
= k x axis is k lines long (K_{max} = 200) k must be multiple of 10

LENY — Y Axis (Independent Variable) Length Indicator

= 120 spaces (Default)
= k y axis is k spaces long (K_{max} = 120). k must be multiple of 10

XMIN — X Axis Minimum Value Indicator

=-99. (Default) Program Scales Data
= x User Provided minimum value for x axis

XMAX — X Axis Maximum Value Indicator

= -99. (Default) Program scales data
= x User provided maximum value for x axis

YMIN1 — Y Axis(1st Independent Variable) Minimum Value Indicator

= -99. (Default) Program scales data
= x User provided minimum value for y axis

YMIN2
YMIN3 — Additional Y axis Minimum Value Indicators

Action same as for YMIN1 except independent variables 2-3-4-5 referenced

YMAX1 — Y Axis (1st Independent Variable) Maximum Value Indicator

= -99. (Default) Program scales data
= x User provided maximum value for y axis

YMAX2
YMAX3
YMAX4
YMAX5 — Additional Y axis Maximum Value Indicators

Action same as for YMAX1 except independent variables 2-3-4-5 referenced

RESTRICTIONS:

1. A maximum of 1024 observations for the dependent variable (x-axis) and 5 x 1024 = 5120 independent variable observations may be plotted. Excess data points are neglected with warning message issued.

2. If user provides non default value for any axis scaling parameter he must also provide values for all other applicable scaling values.

ROUTINE NO.: 7

ROUTINE NAME: HIST

PURPOSE: To provide printer histograms of user selected data files.

USAGE: △$HIST < PARAMETERS > $

PARAMETERS:

NBAR Histogram Interval Indicator

= 10 (Default) Histogram contains 10 intervals.
= k Histogram contains k intervals 1 k 30

NSP Histogram Spacing Indicator

= 4 (Default) Histogram bar spacing interval is 4 spaces.
= 0 or 1 Histogram bar spacing interval is 0 spaces or 1 space respectively.

RUP Histogram Upper Bound Indicator
(Used with RLØW below)

= -99. (Default) Program scales data into NBAR equidistant categories from min value to max value.
= x User provided upper bound of histogram program scales data into NBAR + 2 intervals with:
Interval 1 containing data PLOW
Interval NBAR + 2 containing data RUP
Remaining intervals are equidistant with size

RLØW Histogram Lower Bound Indicator
(Used with RUP above)

= -99. (Default) Program scales data into NBAR equidistant categories from min value to max value
= x User provided lower bound of histogram. (see discussion of RUP above for complete details).

IDEP Histogram Variable Indicator

= 0 (Default) Histogram file undefined
= k Plot histogram of file k

RESTRICTIONS: 1. If non default value of RUP is inputted, a non-default value of RLØW must also be inputted. Similarly, if RLØW has non-default value, RUP must have non-default value. If this criterion is not met, a message is issued and default criterion used.

ROUTINE NO.: 8

ROUTINE NAME: TIME

PURPOSE: To plot from one to five independent variables versus a time parameter such as date. A variety of user scaling options are included.

USAGE: △$TIME <PARAMETERS> $

PARAMETERS: (see PLØT)

All parameters used in routine TIME are identical to those used in PLØT except:

XMIN X Axis Initial Date Indicator

= -99. (Default) Program scales data
= x User provided initial date for x-axis. This date must be in format YYMMDD.

XMAX X Axis Final Date Indicator

= -99. (Default) Program scales data
= x User provided final date for x axis. This date must be in format YYMMDD.

YMIN Y Axis Minimum Indicator

= -99. (Default) Program scales data. Y axis starts at minimum value in file IDEP
= X Y axis starts at X

YMAX Y Axis Maximum Indicator

= -99. (Default) Program scales data. Y axis ends at maximum value in file IDEP.
= X Y axis ends at X.

YBAR1 Y Axis Minimum Reference

= -99. (Default) No reference line provided.
= X Reference line plotted at X. YBAR1 < YBAR2

YBAR2 Y Axis Maximum Reference

= -99. (Default) No reference line provided.
= X Reference line plotted at X. YBAR2 > YBAR1.

RESTRICTIONS:

1. System 2000 files must be provided for all of
   a. IDEP Data
   b. IND1 Date
   c. IND2 LØT
2. If YBAR1, YBAR2 option used one or both of following conditions must be met:
   a. YMAX and YMIN NE -99.
   b. XMAX and YMIN NE -99.
3. Maximum number of points plotted equals 1024. All points in excess of 1024 are ignored.

ROUTINE NO.: 9

ROUTINE NAME: TABLE

PURPOSE: To print selected statistical tables for use in interpreting results of user requested statistical routines.

USAGE: Δ$TABLE < PARAMETERS > $

PARAMETERS:

ITABLE Table Indicator

= 0 (Default) No table printed.
= 1 Normal distribution
= 2 Students t-distribution
ALPHA = .001, .005, .01, .02, .05 (TABLE gives area in both tails.
= 3 CHISQ Distribution
ALPHA = .001, .005, .01, .025, .05, .1 (TABLE gives area in single tail)
= 4 F-Distribution
ALPHA = .01, .05 (TABLE gives area in single tail).

APPENDIX C

DEFINITIONS

```
SYSTEM RELEASE NUMBER        2.303
DATA BASE NAME IS ARTIL
DEFINITION NUMBER      56
DATA BASE CYCLE        621
   1*  CALIBER (NAME X(10) WITH SOME FUTURE ADDITIONS)
   2*  TYPE (NAME X(10) WITH SOME FUTURE ADDITIONS)
   3*  LOT (NAME X(12))
   4*  P NUMBER (NAME X(10) WITH SOME FUTURE ADDITIONS)
   5*  QUANTITY (NON-KEY INTEGER NUMBER 9(6))
   6*  MANUFACTURER (NAME X(10) WITH SOME FUTURE ADDITIONS)
   7*  INITIAL LISP (NAME X(10) WITH SOME FUTURE ADDITIONS)
   8*  FINAL DISP (NAME X(10) WITH SOME FUTURE ADDITIONS)
   9*  PROVING GROUND (NAME X(10) WITH SOME FUTURE ADDITIONS)
  10*  TEST DATE (DATE)
  11*  ASSEMBLY DATE (DATE)
  12*  TYPE TEST (NON-KEY NAME X(10))
  13*  FIRING RECORD NUMBER (NON-KEY NAME X(10))
  14*  ITEM NOMENCLATURE (NON-KEY TEXT X(60))
  15*  CAUSE OF REJECTION (NON-KEY TEXT X(60))
  16*  RELATED FIRING RECORD (NON-KEY NAME X(10))
  17*  CORRECTION (NON-KEY NAME X(10))
  18*  SPECIFICATION (NAME X(15))
  19*  DRAWING (NAME X(10))
 100*  BALLISTIC TEST INFO (R6)
 110*  TEST NAME (NAME X(10) IN 100)
 111*  PHASE (NAME X(10) IN 100)
 112*  REF VS TEST (NAME XXXX IN 100)
 113*  DATE FIRED (DATE IN 100)
 114*  APPROX TIME FIRED (NON-KEY INTEGER NUMBER 9999 IN 100)
 115*  AZIMUTH (NON-KEY DECIMAL NUMBER 999.99 IN 100)
 116*  TARGET DISTANCE (NON-KEY INTEGER NUMBER 9(5) IN 100)
 117*  FIRING POSITION (NON-KEY NAME X(5) IN 100)
 118*  WIND VELOCITY (NON-KEY INTEGER NUMBER 999 IN 100)
 119*  WIND DIRECTION (NON-KEY INTEGER NUMBER 999 IN 100)
 120*  PROP CHG (NAME X(10) IN 100)
 121*  TEST REMARKS (NON-KEY TEXT X(60) IN 100)
 122*  TUBE NUMBER (NAME X(20) IN 100)
 123*  TEST SAMPLES (NON-KEY INTEGER NUMBER 9(5) IN 100)
```

```
200*  PHASE SUMMARY-HE WP (RG IN 100)
  210*  VEL N-HE (NON-KEY INTEGER NUMBER 999 IN 200)
  211*  VEL MEAN-HE (DECIMAL NUMBER 9(5).99 IN 200)
  212*  VEL CORR MEAN-HE (DECIMAL NUMBER 9(5).99 IN 200)
  213*  VEL STD-HE (DECIMAL NUMBER 999.99 IN 200)
  214*  VEL MAX-HE (NON-KEY DECIMAL NUMBER 9(5).99 IN 200)
  215*  VEL MIN-HE (NON-KEY DECIMAL NUMBER 9(5).99 IN 200)
  220*  PRESS N-HE (NON-KEY INTEGER NUMBER 999 IN 200)
  221*  PRESS MEAN-HE (INTEGER NUMBER 9(6) IN 200)
  222*  PRESS MAX-HE (INTEGER NUMBER 9(6) IN 200)
  223*  PRESS MIN-HE (INTEGER NUMBER 9(6) IN 200)
  230*  RANGE N-HE (NON-KEY INTEGER NUMBER 999 IN 200)
  231*  RANGE MEAN-HE (INTEGER NUMBER 9(5) IN 200)
  232*  RNG STD (NON-KEY DECIMAL NUMBER 999.9 IN 200)
  233*  RANGE MAX-HE (NON-KEY INTEGER NUMBER 9(5) IN 200)
  234*  RANGE MIN-HE (NON-KEY INTEGER NUMBER 9(5) IN 200)
  240*  DEFL N-HE (NON-KEY INTEGER NUMBER 999 IN 200)
  241*  DEFL MEAN-HE (DECIMAL NUMBER 9999.9 IN 200)
  242*  DEFL STD-HE (NON-KEY DECIMAL NUMBER 999.9 IN 200)
  250*  TRACER N-HE (NON-KEY INTEGER NUMBER 999 IN 200)
  251*  TRACER MEAN-HE (DECIMAL NUMBER 99.9 IN 200)
  252*  TRACER STD-HE (NON-KEY DECIMAL NUMBER 99.9 IN 200)
  253*  TRACER MIN-HE (NON-KEY DECIMAL NUMBER 99.9 IN 200)
  254*  FLAG-HE (INTEGER NUMBER 9 IN 200)
  280*  R BY R INFO-HE WP (RG IN 200)
    281*  ROUND-HE (NON-KEY INTEGER NUMBER 9(5) IN 280)
    282*  SAMPLE-HE (NON-KEY INTEGER NUMBER 999 IN 280)
    283*  PROJ FACT-HE (NON-KEY NAME X(9) IN 280)
    284*  FUZE FACT-HE (NON-KEY NAME X(9) IN 280)
    285*  VEL-HE (NON-KEY DECIMAL NUMBER 9999.9 IN 280)
    286*  RANGE-HE (NON-KEY INTEGER NUMBER 9999 IN 280)
    287*  DEFL-HE (NON-KEY INTEGER NUMBER 9999 IN 280)
    288*  PRESS-HE (NON-KEY INTEGER NUMBER 999 IN 280)
    289*  WEIGHT-HE (NON-KEY DECIMAL NUMBER 999.99 IN 280)
    290*  REPAIR-HE (NON-KEY NAME X(9) IN 280)
    291*  RFLAG-HE (INTEGER NUMBER 9 IN 280)
    292*  DEFECT-HE (NAME X(10) IN 280)
    295*  TRACER INFO-HE WP (RG IN 280)
      296*  TRACE FUNC (NON-KEY NAME XXXX IN 295)
      297*  TRACE TIME (NON-KEY DECIMAL NUMBER 99.9 IN 295)
300*  PHASE SUMMARY-ILLUM (RG IN 100)
  301*  EFFECT ILLUM N (NON-KEY INTEGER NUMBER 999 IN 300)
  302*  EFFECT ILLUM MAXIMUM (DECIMAL NUMBER 999.9 IN 300)
  303*  EFFECT ILLUM MINIMUM (DECIMAL NUMBER 999.9 IN 300)
  310*  BURST HT N (NON-KEY INTEGER NUMBER 999 IN 300)
  311*  BURST HT MAXIMUM (INTEGER NUMBER 9999 IN 300)
  312*  BURST HT MINIMUM (INTEGER NUMBER 9999 IN 300)
  320*  RANGE N-ILLUM (NON-KEY INTEGER NUMBER 999 IN 300)
  321*  RANGE MEAN-ILLUM (INTEGER NUMBER 9999 IN 300)
  322*  RANGE MAX-ILLUM (INTEGER NUMBER 9999 IN 300)
  323*  RANGE MIN-ILLUM (INTEGER NUMBER 9999 IN 300)
  330*  FUZE TIME N (NON-KEY INTEGER NUMBER 999 IN 300)
  331*  FUZE TIME MEAN (DECIMAL NUMBER 99.99 IN 300)
  332*  FUZE TIME STD (NON-KEY DECIMAL NUMBER 99.99 IN 300)
  333*  FUZE TIME MAXIMUM (DECIMAL NUMBER 99.99 IN 300)
  334*  FUZE TIME MINIMUM (DECIMAL NUMBER 99.99 IN 300)
  335*  FUZE TIME LOT DEF (DECIMAL NUMBER 999.999 IN 300)
  336*  FUZE TIME CORRECTION (NON-KEY DECIMAL NUMBER 9.999 IN 300)
```

```
340*  CHUTE DELAY N (NON-KEY INTEGER NUMBER 999 IN 300)
341*  CHUTE DELAY MAXIMUM (DECIMAL NUMBER 99.9 IN 300)
342*  CHUTE DELAY MINIMUM (DECIMAL NUMBER 99.9 IN 300)
350*  VEL N-ILLUM (NON-KEY INTEGER NUMBER 999 IN 300)
351*  VEL MAX-ILLUM (INTEGER NUMBER 9999 IN 300)
352*  VEL MIN-ILLUM (INTEGER NUMBER 9999 IN 300)
360*  DEFL N-ILLUM (NON-KEY INTEGER NUMBER 999 IN 300)
361*  DEFL MAX-ILLUM (INTEGER NUMBER 9999 IN 300)
362*  DEFL MIN-ILLUM (INTEGER NUMBER 9999 IN 300)
370*  DESCENT RATE N (NON-KEY INTEGER NUMBER 999 IN 300)
371*  DESCENT RATE MAXIMUM (DECIMAL NUMBER 99.9 IN 300)
372*  DESCENT RATE MINIMUM (DECIMAL NUMBER 99.9 IN 300)
373*  FLAG-ILLUM (INTEGER NUMBER 9 IN 300)
380*  R BY R INFO-ILLUM (RG IN 300)
  381*  ROUND-ILLUM (NON-KEY INTEGER NUMBER 9(5) IN 380)
  382*  SAMPLE-ILLUM (NON-KEY INTEGER NUMBER 999 IN 380)
  383*  EFFECT ILLUM (NON-KEY DECIMAL NUMBER 999.9 IN 380)
  384*  BURST HT (NON-KEY INTEGER NUMBER 9999 IN 380)
  385*  RANGE-ILLUM (NON-KEY INTEGER NUMBER 9999 IN 380)
  386*  FUZE TIME UNCORR (NON-KEY DECIMAL NUMBER 99.99 IN 380)
  387*  CHUTE DELAY (NON-KEY DECIMAL NUMBER 99.9 IN 380)
  388*  VEL-ILLUM (NON-KEY INTEGER NUMBER 9999 IN 380)
  389*  DEFL-ILLUM (NON-KEY INTEGER NUMBER 9999 IN 380)
  390*  DESCENT RATE (NON-KEY DECIMAL NUMBER 99.9 IN 380)
  391*  REMARK-ILLUM (NON-KEY NAME X(5) IN 380)
  392*  PRESS-ILLUM (NON-KEY INTEGER NUMBER 999 IN 380)
  393*  RFLAG-ILLUM (INTEGER NUMBER 9 IN 380)
  394*  DEFECT-ILLUM (NAME X(10) IN 380)
400*  PHASE SUMMARY-HEP HEAT APDS TP (RG IN 100)
  410*  VEL N-HEP (NON-KEY INTEGER NUMBER 999 IN 400)
  411*  VEL MEAN-HEP (INTEGER NUMBER 9999 IN 400)
  412*  VEL CORR MEAN-HEP (INTEGER NUMBER 9999 IN 400)
  413*  VEL STD-HEP (DECIMAL NUMBER 99.9 IN 400)
  414*  VEL EXT VAR-HEP (NON-KEY INTEGER NUMBER 999 IN 400)
  420*  PRESS N-HEP (NON-KEY INTEGER NUMBER 999 IN 400)
  421*  PRESS MEAN-HEP (INTEGER NUMBER 999 IN 400)
  422*  PRESS STD-HEP (NON-KEY DECIMAL NUMBER 99.9 IN 400)
  423*  PRESS MAX-HEP (INTEGER NUMBER 999 IN 400)
  424*  PRESS MIN-HEP (INTEGER NUMBER 999 IN 400)
  430*  PE N (NON-KEY INTEGER NUMBER 999 IN 400)
  431*  PE HOR (DECIMAL NUMBER 9.99 IN 400)
  432*  PE VERT (DECIMAL NUMBER 9.99 IN 400)
  440*  DISP N (NON-KEY INTEGER NUMBER 999 IN 400)
  441*  DISP HOR (INTEGER NUMBER 999 IN 400)
  442*  DISP VERT (INTEGER NUMBER 999 IN 400)
  443*  FLAG-HEP (INTEGER NUMBER 9 IN 400)
  444*  DISP HOR STD (DECIMAL NUMBER 999.99 IN 400)
  445*  DISP VERT STD (DECIMAL NUMBER 999.99 IN 400)
  460*  R BY R INFO-HEP HEAT APDS TP (RG IN 400)
    461*  ROUND-HEP (NON-KEY INTEGER NUMBER 9(5) IN 460)
    462*  SAMPLE-HEP (NON-KEY INTEGER NUMBER 999 IN 460)
    463*  PROJ FACT-HEP (NON-KEY NAME XXXX IN 460)
    464*  VEL-HEP (NON-KEY DECIMAL NUMBER 9999.9 IN 460)
    465*  HOR COORD-HEP (NON-KEY INTEGER NUMBER 999 IN 460)
    466*  VERT COORD-HEP (NON-KEY INTEGER NUMBER 999 IN 460)
    467*  PRESS-HEP (NON-KEY INTEGER NUMBER 999 IN 460)
    468*  WEIGHT-HEP (NON-KEY DECIMAL NUMBER 999.99 IN 460)
    469*  TRACER FACT-HEP (NON-KEY NAME XXXX IN 460)
    470*  DEFL-HEP (NON-KEY DECIMAL NUMBER 99.9 IN 460)
    471*  REMARK-HEP (NON-KEY NAME X(5) IN 460)
    472*  RFLAG-HEP (INTEGER NUMBER 9 IN 460)
    473*  DEFECT-HEP (NAME X(10) IN 460)
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        480*  HEP HEAT PLATE INFO (RG IN 460)
          481*  P (NON-KEY INTEGER NUMBER 9 IN 480)
          482*  EHD HOR (NON-KEY DECIMAL NUMBER 9.99 IN 480)
          483*  EHD VERT (NON-KEY DECIMAL NUMBER 9.99 IN 480)
      150*  DEFECT SUMMARY (RG IN 100)
        151*  DEFECT NAME (NAME X(10) IN 150)
        152*  NO OF OCC (INTEGER NUMBER 999 IN 150)
        153*  DEFECT NOTE (NON-KEY NAME X(80) IN 150)
    900*  DATA CARD INFO (RG)
      901*  COMPONENT NAME (NAME X(10) IN 900)
      902*  COMPONENT M NUMBER (NAME X(10) IN 900)
      910*  COMPONENT LOT INFO (RG IN 900)
        911*  COMPONENT LOT (NAME X(12) IN 910)
        912*  COMPONENT QUANTITY (NON-KEY INTEGER NUMBER 9(6) IN 910)
        913*  COMPONENT DATE (NON-KEY DATE IN 910)
    920*  ARTILLERY SUPPORT EQUIPMENT INFO (RG)
      921*  EQUIP NAME (NAME X(10) IN 920)
      922*  EQUIP MODEL (NON-KEY NAME X(10) IN 920)
      923*  EQUIP LOT (NON-KEY NAME X(12) IN 920)
    980*  COMMENT INFO (RG)
      981*  COMMENTS (TEXT X(100) IN 980)
   4001*  AIDS (RG)
     4002*  ZZZ2 (NON-KEY TEXT X(20) IN 4001)
   1000*  HELP INFO (RG)
     1010*  COMMAND NAME (NAME X(10) IN 1000)
     1020*  COMMAND INFO (RG IN 1000)
       1030*  SUBCOMMAND NAME (NAME X(10) IN 1020)
       1031*  SUBCOMMAND SEQUENCE (NON-KEY INTEGER NUMBER 99 IN 1020)
       1040*  SUBCOMMAND INFO (RG IN 1020)
         1050*  SUBCOMMAND TEXT (NON-KEY TEXT X(72) IN 1040)
         1051*  SEQUENCE NUMBER (NON-KEY INTEGER NUMBER 999 IN 1040)
   4003*  ZZZ1 (STRING (MESSAGE FILE IS OUTPUT%PRINT/NULL SUPPRESS,STUB S
          UPPRESS/ZZZZ2%))
   4004*  ANIES (STRING (MESSAGE FILE IS DUMP%CONTROL%DBN IS ANIES%MESSAG
          E FILE IS OUTPUT% PRINT/NULL SUPPRESS,STUB SUPPRESS/ZZZZ2%))
   4005*  DISPLAY (STRING (PRINT/NAME,STUB,GROUP,NULL SUPPRESS,REPEAT SUP
          PRESS/BY ENTRY,C1,C2,C3,C4,C5,C6,C7,C8,C9,C10,C12,C13,C14,C100,
          C200,C300,C400,C920,C980 WH C3  EQ *1*%*ZZZ1*%))
   4006*  SUMMARY (STRING (LIST/REPEAT,TITLE D(25)ARTIL LOT SUMMARY,L(7)C
          ALIBER,       L(7) TYPE,L(12)LOT NUMBER,L(8)M NUMBER,L(10)DATE T
          EST,L(10)  DISP/C1,C2,C3,C4,  C10,C8,OB C1,C2,C3 WH C3 EXISTS%)
          )
   4060*  DATACARD (STRING (LIST/REPEAT SUP,TITLE D(20)ARTIL DATA CARDS P
          RESENT,       L(7)CALIBER,L(7)TYPE,L(12)LOT NUMBER,L(8)M NUMBER,
          L(10)DATE TEST,L(10)DISP/C1,  C2,C3,C4,C10,C8,OB C1,C2,C3 WH C3
           EXISTS AND C901 EXISTS%))
   4061*  NODATACARD (STRING (LIST/REPEAT SUP,TITLE D(20)ARTIL DATA CARDS
           MISSING,    L(7)CALIBER,L(7)TYPE,L(12)LOT NUMBER,L(8)M NUMBER,
          L(10)DATE TEST,L(10)DISP/C1,  C2,C3,C4,C10,C8,OB C1,C2,C3 WH C3
           EXISTS AND C901 FAILS%))
   4070*  DISPOSITION (STRING (LIST/REPEAT,TITLE D(20) ARTIL SUMMARY BY D
          ISP,        L(7)CALIBER,L(7)TYPE,L(12)LOT NUMBER,L(8)M NUMBER,L
          (10)DATE TEST,L(10)DISP/C1,  C2,C3,C4,C10,C8,OB C1,C2,C3 WH C3
          EXISTS AND C8 EQ *1*%))
   4050*  TYPESUM (STRING (LIST/REPEAT,TITLE D(25)ARTIL LOT SUMMARY BY TY
          PE,L.7)CALIBER,L(7)TYPE,L(12)LOT NUMBER,L(8)M NUMBER,L(10)DATE
          TEST,L(10)DISP/C1,C2,C3,C4,   C10,C8,OB C1,C2,C3 WH C3 EXISTS
          AND C2 EQ *1*%))
   4052*  CALTYPE (STRING (LIST/REPEAT,TITLE D(20)ARTIL LOT SUMMARY BY CA
          LIBER TYPE,  L(7)CALIBER,L(7)TYPE,L(12)LOT NUMBER,L(8)M NUMBER,
          L(10)DATE TEST,L(10)DISP/C1,  C2,C3,C4,C10,C8,OB C1,C2,C3 WH C3
           EXISTS AND C1 EQ *1* AND C2 EQ *2*%))
```

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4051* CALSUM (STRING (LIST/REPEAT,TITLE D(25)ARTIL LOT SUMMARY BY CAL
      IBER,L(7)CALIBER,L(7)TYPE,L(12)LOT NUMBER,L(8)M NUMBER,L(10)CAT
      E TEST,L(10)DISP/C1,C2,C3,C4, C10,C8,OB C1,C2,C3 WH C3 EXISTS A
      ND C1 EQ *1*%))
4080* DATESUM (STRING (LIST/REPEAT,TITLE D(20) ARTIL SUMMARY BY DATE,
                L(7)CALIBER,L(7)TYPE,L(12)LOT NUMBER,L(8)M NUMBER,L
      (10)DATE TEST,L(10)DISP/C1-  C2,C3,C4,C10,C8,OB C10,C1,C2,C3 WH
       C3 EXISTS AND C10 GE *1* AND C10 LE *2*%))
4030* TALLY (STRING (TALLY/EACH/C1%TALLY/EACH/C2%TALLY/EACH/C4%))
3333* FILE (STRING (REPORT FILE IS      *1*%PRINT/BLOCK,STUB SUP,NULL,
      SINGLE SPACE/% DESCRIBE *2*% PRINT *2* WH *3*%))
3000* ILLUMER (STRING (*LAB2* *1*% *LAB3* *ILAB2* *ILAB2A*% *DCLIST*
      *EQUIP*      PRINT/NULL SUP,NAME/C981 WH SAME%))
4040* HEMPER (STRING (*LAB2* *1*% *LAB3*                    *LAB6* *DCLIST
      * *EQUIP*     PRINT/NULL SUP,NAME/C981 WH SA%))
4043* LAB3 (STRING (PRINT/NAME,NULL SUP,STUB,INDENT/C10,C11,C12,C13,C
      14,C15,C16,  C17 WH SAME% PRINT/GROUP/ BY ENTRY,C100,C200,C300,
      C400 WH SAME%))
4042* LAB2 (STRING (LIST/NULL SUP,TITLE D(30) ACCEPTANCE TEST SUMMARY
      ,L(12)+LOT NUMBER,B(2),L(7)+CALIBER,B(2),L(6)+ TYPE,B(2),L(8)+M
       NUMBER,L(8)+QUANTITY,L(10)MANU-+FACTORER,L(10)INITIAL+ DISP,L
      (10)FINAL+DISP,L(10)PROVING+GROUND/*LAB2A*))
4041* LAB2A (STRING (C3,C1,C2,C4,C5,C6,C7,C8,C9 WH LOT ES))
4046* LAB5 (STRING (LIST/TITLE L(10)+TEST NAME,B(2),L(10)  TEST+PHASE
      ,B(2),L(3)VEL+ N,B(2),L(6)  VEL+ MEAN,B(2),L(6) VEL+STD,L(4)FRE
      S+ N,B(2),L(4)PRES+MEAN,B(2),L(4)PRES+MAX,B(2),L(4)PRES+MIN,L(3
      )RNG+ N,B(2),L(5)RNG+MEAN,B(2),L(5)RNG+STD,L(4)DEFL+ N,B(2),*LA
      B5A*%))
4047* LAB5A (STRING (L(5)DEFL+MEAN,B(2),L(5)DEFL+STD,L(5)TRACE+  N,B(
      2),L(5)TRACE+MEAN/C110,C111,C210,C212,C215,C220,C221,C222,C223,
      C230,C231,C232,C240,C241,C242,C250,C251 WH SA))
4048* LAB6 (STRING (LIST/REPEAT SUP,TITLE D(30)ROUND BY ROUND DATA,L(
      12)+LOT NUMBER,L(10)+PHASE,L(6)ROUND+NUMBER,L(6)SAMPLE+NUMBER,L
      (6)PROJ+FUNC,L(6)FUZE+ACTION,L(6)+  VEL,L(5)+RANGE,L(4)+DEFL,L(
      4)+PRES,L(6)+WEIGHT,L(10)+REMARKS/ *LAB6A*%))
4049* LAB6A (STRING (C3,C111,C201,C202,C203,C204,C205,C206,C207,C208,
      C209,C290 WH SA))
4021* EQUIP (STRING (LIST/REPEAT SUP,TITLE D(30)SUPPORT EQUIPMENT SUM
      MARY,L(12)+LOT NUMBER,L(10)+EQUIP NAME,L(12)+EQUIP MODEL,L(20)+
      EQUIP LOT/C3,C921,C922,C923 WH SA%))
3010* HEPHEATER (STRING (*LAB2* *1*% *LAB3* *HLAB2* *HLAB2A*% *DCLIST
      * *EQUIP*    PRINT/NULL SUP,NAME/ C981 WH SAME%))
3011* HLAB2 (STRING (LIST/REPEAT SUP,TITLE D(30)ROUND BY ROUND DATA,L
      (12)+LOT NUMBER,L(10)+PHASE,L(6)ROUND+NUMBER,L(6)SAMPLE+NUMBER,
      L(6)PROJ+FUNC,L(6)+VELOC,L(5)COORD+ HOR,L(6)COORD+VERT,L(4)+FRE
      S,L(6)+WEIGHT,L(6)TRACER+FUNC,L(4) AZ+DEFL,L(10)+REMARKS, *HLAB
      2A*/))
3012* HLAB2A (STRING (L(3)+ P,L(4)END+HOR,L(4)END+VERT))
3013* HLAB2B (STRING (C3,C111,C461,C462,C463,C464,C465,C466,C467,C468
      ,C469,C470,  C471,C481,C482,C483 WH SAME))
1060* HELP (STRING (PRINT/NULL SUP,INDENT,REPEAT SUP,STUB SUP,TREE/C1
      010,C1030,C1050,OB C1051,C1051 WHERE C1010 EQ HELP%PRINT/STUB,R
      EPEAT/%))
1070* HELP1 (STRING (PRINT/NULL SUP,INDENT,REPEAT SUP,STUB SUP,TREE/
      C1010,C1030,C1050,OB C1031,C1051 WHERE C1010 EQ *1*% PRINT/STUB
      ,REPEAT/%))
1080* HELP2 (STRING (PRINT/NULL SUP,INDENT,REPEAT SUP,STUB SUP,GROUP/
      C1010,       C1030,C1050,OB C1051 WHERE C1010 EQ *1* AND C1020
      EQ *2*%PRINT/STUB,REPEAT,TREE/%))
1090* HELPCOMMAND (STRING (LIST/NULL SUP,TITLE D(5)ARIES COMMAND SUMM
      ARY,L(12)+COMMAND NAME,B(20)/ C1010 WHERE C1 EQ HELP%))
```

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2050* M456A1 (STRING (REPORT FILE IS S2KIN% *A1* *A2* *1* AND TEST DA
      TE LE *2*%   *A3* *A4* *A5* *A6*))
2051* A1 (STRING (PRINT/NULL,REPEAT SUP,BLOCK,STUB SUPPRESS,GROUP/%))
2052* A2 (STRING (PRINT COUNT C3 WHERE C4 EQ M456A1 AND TEST DATE EE)
      )
2053* A3 (STRING (PRINT COUNT C3 WHERE SAME AND C7 EQ ACCEPTED% PRINT
       COUNT C3 WHERE SAME AND C7 EQ REJECTED% PRINT COUNT C3 WHERE S
      AME AND C7 EQ PROV ACCEP%))
2054* A4 (STRING (LIST/NULL SUP,TITLE L(12)+LOT NUMBER,L(5)+PHASE,L(8
      )VEL MEAN+UNCORR,L(8)VEL MEAN+CORR,L(8)VEL+STD,L(8)+PE HOR,L(8)
      +PE VERT/C3,C112,C411,C412,C415,C431,C432,OB C3,C112 WHERE SAME
      %))
2055* A5 (STRING (LIST/TITLE L(12)+LOT NUMBER,L(10)+PHASE,,(10)+N TES
      T,L(20)+MALFUNCTIONS/C3,C111,C410,C122,OB C3,C111 WHERE SAME AN
      D C111 EQ PLATE OR C111 EQ TRACER%))
2066* AA (STRING (REPORT FILE IS TEMP% UNLOAD/REPEAT,NULL/C901,C903,O
      B C901 WHERE SAME AND C901 EQ PROJECTILE OR C901 EQ FUZE OR C90
      1 EQ PRIMER OR C901 EQ TRACER))
4006* COMPLOT (STRING (PRINT/NAME,STUB,GROUP,NULL SUPPRESS REPEAT SUP
      PRESS/BY ENTRY,C1,C2,C3,C4,C5,C6,C7,C8,C9,C10,C12,C13,C14,C9C0,
      C910 WH C3 EQ *1*%*ZZZ1*%))
4007* CNLOTS (STRING (PRINT/NAME,STUB,GROUP,NULL SUPPRESS,REPEAT SUPP
      RESS/BY ENTRY,C3,C5,C7,C6,C10 WHERE C911 EQ *1*%*ZZZ1*%))
4008* CSEARCH (STRING (LIST/REPEAT SUP,TITLE D(20)*1*,CP+LOT NUMBER,B
      (3),L(6)CR+QUANT,B(3),L(10)CR DISP,B(3),L(10)CR TEST+DATE,B(3),
      L(10),COMPONENT+QUANT/C3,C5,C7,C10,C912,OB C3,C10 WH C911 EQ *1
      *%*ZZZ1*%))
4081* ZZZSUM (STRING (LIST/REPEAT SUP,TITLE D(20) ACCEPTANCE TEST SUM
      MARY ,L(12)LOTNUMBER,L(10)TEST DATE,L(10)STATUS,L(10)PHASE,L(20
      )MALFUNCTIONS,L(5)MEAN+VEL,L(5)S.D.+VEL,L(6)MEAN+PRESS,L(6)MAX+
      PRESS,L(5)MEAN+RANGE,L(5)S.D.+RANGE/*ZZ1SUM*))
4082* ZZ1SUM (STRING (C3,C10,C6,C111,C122,C211,C213,C221,C222,C231,C2
      32))
4086* ASUM (STRING (*ZZZSUM* WHERE *1*%*ZZZ1*%))
4087* BSUM (STRING (*ZZZSUM*,OB C3 WHERE C4 EQ *1*%))
4090* CROSS (STRING (REPORT FILE IS CROSS*LAB2* *1* % *LAB3* *DCLIST*
       REPORT FILE IS OUTPUT% PRINT/NULL,NAME/C901,C911 WHERE SAME AN
      D (C901 EQ PROPELLANT OR C901 EQ FUZE)%))
4091* ACROSS (STRING (CONTROL%GRN IS COMP%REPORT FILE IS CROSS*LAB1*
      *1*%*LAB2* *PROP1* *PROP2* *PROP3* *LAB1* *2*% *LAB2* *FUZE1* *
      FUZE2* *FUZE3* *FUZE4* CONTROL  %GRN IS ARTIL% REPORT FILE IS O
      UTPUT%))
4020* CLLIST (STRING (LIST/REPEAT SUP,TITLE D(30)DATA CARD SUMMARY,L(
      12)+LOT NUMBER,L(10)COMPONENT+  NAME,L(20)COMPONENT+  LOT,L(10)
      COMPONENT+QUANTITY,L(10)COMPONENT+DATE MANU/C3,C901,C911,C912,C
      913 WH SA%))
40AP* CSUM (STRING (*ZZZSUM* ,OB C3 WHERE C1 EQ *1* AND C2 EQ *2* AND
       C10  GE *3* AND C10 LE *4*%))
```

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3002*  ILAB2 (STRING (LIST/REPEAT SUP,TITLE D(30)ROUND BY ROUND DATA,L
       (12)+LOT NUMBER,L(10)+PHASE,L(6)ROUND+NUMBER,L(6)SAMPLE+NUMBER,
       L(6)EFFECT+ILLUM,L(5)BURST+  HT,L(5)HORIZ+RANGE,L(5)ELEVE+ MS,L
       (5)CHUTE+DELAY,L(4)+VEL,L(6)+DEFLEC,L(7)DESCENT+  RATE,L(4+ PRE
       S,))
3003*  ILAB2A (STRING (L(7)+REMARKS/C3,C111,C381,C382,C383,C384,C385,C
       386,C387,C388,C389,C390,C392,C391 WH SAME))
2001*  FILE1 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE1
       %          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2002*  FILE2 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE2
       %          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2003*  FILE3 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE3
       %          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2004*  FILE4 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE4
       %          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2005*  FILE5 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE5
       %          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2006*  FILE6 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE6
       %          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2007*  FILE7 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE7
       %          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2008*  FILE8 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE8
       %          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2009*  FILE9 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE9
       %          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2010*  FILE10 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       10%          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2011*  FILE11 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       11%          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2012*  FILE12 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       12%          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2013*  FILE13 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       13%          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2014*  FILE14 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       14%          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2015*  FILE15 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       15%          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2016*  FILE16 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       16%          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2017*  FILE17 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       17%          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2018*  FILE18 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       18%          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2019*  FILE19 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       19%          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2020*  FILE20 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       20%          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2507*  DEF5 (STRING (PR/NAME/MIN C14,COUNT C3,SUM C123 WH C4 EQ *1*%PR
       SUM C152 WH   SA AND C151 EQ *2*%))
```

SYSTEM RELEASE NUMBER 2.30S
DATA BASE NAME IS COMP
DEFINITION NUMBER 41
DATA BASE CYCLE 95

1* CALIBER (NAME X(10) WITH SOME FUTURE ADDITIONS)
2* TYPE (NAME X(10) WITH SOME FUTURE ADDITIONS)
3* LOT (NAME X(12))
4* P NUMBER (NAME X(10) WITH SOME FUTURE ADDITIONS)
5* QUANTITY (NON-KEY INTEGER NUMBER 9(6))
6* MANUFACTURER (NAME X(10) WITH SOME FUTURE ADDITIONS)
7* INITIAL DISP (NAME X(10) WITH SOME FUTURE ADDITIONS)
8* FINAL DISP (NAME X(10) WITH SOME FUTURE ADDITIONS)
9* PROVING GROUND (NAME X(10) WITH SOME FUTURE ADDITIONS)
10* TEST DATE (DATE)
11* ASSEMBLY DATE (DATE)
12* TYPE TEST (NON-KEY NAME X(10))
13* FIRING RECORD NUMBER (NON-KEY NAME X(10))
14* ITEM NOMENCLATURE (NON-KEY TEXT X(80))
15* TEST DIRECTOR (NON-KEY NAME X(10))
16* SPECIFICATION (NON-KEY NAME X(10))
17* CAUSE OF REJECTION (NAME X(80))
18* RELATED FIRING RECORD (NON-KEY NAME X(12))
19* DRAWING (NAME X(10))
100* PROP TEST INFO (RG)
101* PROP CAUSE OF REJECTION (NON-KEY TEXT X(80) IN 100)
102* PROP RELATED FIRING RECORD (NON-KEY NAME X(10) IN 100)
110* PERCENT NITROCELLULOSE (DECIMAL NUMBER 999.99 IN 100)
111* PERCENT NITROGLYCERINE (DECIMAL NUMBER 999.99 IN 100)
112* PERCENT NITROGUANIDINE (DECIMAL NUMBER 999.99 IN 100)
113* PERCENT ETHYL CENTRALITE (DECIMAL NUMBER 999.99 IN 100)
114* PERCENT DNT (DECIMAL NUMBER 999.99 IN 100)
115* PERCENT DPA (DECIMAL NUMBER 999.99 IN 100)
116* PERCENT SALT (NON-KEY DECIMAL NUMBER 999.99 IN 100)
117* PERCENT VOLATILES (NON-KEY DECIMAL NUMBER 999.99 IN 100)
118* PERCENT MOISTURE (DECIMAL NUMBER 999.99 IN 100)
119* PERCENT GLAZE (NON-KEY DECIMAL NUMBER 999.99 IN 100)
120* RG (DECIMAL NUMBER 999.99 IN 100)
121* RF (DECIMAL NUMBER 999.99 IN 100)
122* CLOSED BOMB STANDARD LOT (NAME X(12) IN 100)
123* HEAT TEST (NON-KEY NAME X(10) IN 100)

```
130* PROP ACCEPTANCE TEST INFO (RG IN 100)
  131* PROP TEST PHASE (NAME X(10) IN 130)
  132* PROP TEST TEMP (INTEGER NUMBER 9999 IN 130)
  133* PROP N FIRED (NON-KEY INTEGER NUMBER 999 IN 130)
  134* PROP N CONS (NON-KEY INTEGER NUMBER 999 IN 130)
  135* PROP CHG WT (DECIMAL NUMBER 9999.99 IN 130)
  136* PROP MALFUNCTIONS (NAME X(10) IN 130)
  140* PROP OBS VEL FPS MEAN (INTEGER NUMBER 9(5) IN 130)
  141* PROP CORR VEL FPS MEAN (INTEGER NUMBER 9(5) IN 130)
  142* PROP VEL FPS STD (DECIMAL NUMBER 999.9 IN 130)
  143* PROP OBS PRES MEAN (INTEGER NUMBER 9(5) IN 130)
  144* PROP PRESSURE STD (INTEGER NUMBER 9(5) IN 130)
  145* PROP CALIBRATION LOT (NAME X(10) IN 130)
  146* PROP SECONDARY LOT (NAME X(10) IN 130)
  147* PROP VEL CORRECTION (DECIMAL NUMBER 9(6).999 IN 130)
  148* PROP PRES CORRECTION (DECIMAL NUMBER 9(6).999 IN 130)
  149* PROP WT CORRECTION (DECIMAL NUMBER 9(6).999 IN 130)
  137* MUZ TO COIL DIST (NON-KEY DECIMAL NUMBER 999.99 IN 130)
  138* COIL1 TO COIL2 DIST (NON-KEY DECIMAL NUMBER 999.99 IN 130)
  190* PROP ROUND BY ROUND (RG IN 130)
    191* ROUND NUMBER (NON-KEY INTEGER NUMBER 9(5) IN 190)
    192* SAMPLE NUMBER (NON-KEY INTEGER NUMBER 999 IN 190)
    193* PRESSURE (NON-KEY INTEGER NUMBER 9(5) IN 190)
    194* VELOCITY (NON-KEY INTEGER NUMBER 9999 IN 190)
    195* FLAG (INTEGER NUMBER 9 IN 190)
    196* PROP DEFECT (NAME X(10) IN 190)
150* PROP RECOMMENDED CHARGE INFO (RG IN 100)
  151* PROP CONFIGURATION (NAME X(10) IN 150)
  152* PROP ZONE (NAME X(10) IN 150)
  153* PROP REC CHG WT INCR (DECIMAL NUMBER 9(6).999 IN 150)
  154* PROP REC CHG WT TOTAL (DECIMAL NUMBER 9(6).999 IN 150)
  155* PROP REC VEL (DECIMAL NUMBER 9(6).999 IN 150)
  156* PROP REC PRES (DECIMAL NUMBER 9(6).999 IN 150)
160* PROP DIMENSION INFO (RG IN 100)
  161* PROP DIMENSION NAME (NAME X(10) IN 160)
  162* PROP DIMENSION VALUE (NON-KEY DECIMAL NUMBER 9999.9999 IN 1
       60)
170* PROP SUPPORT EQUIPMENT INFO (RG IN 100)
  171* PROP EQUIP NAME (NAME X(10) IN 170)
  172* PROP EQUIP MODEL (NON-KEY NAME X(10) IN 170)
  173* PROP EQUIP LOT (NON-KEY NAME X(12) IN 170)
200* FUZE TEST INFO (RG)
  201* FUZE CAUSE OF REJECTION (NON-KEY TEXT X(80) IN 200)
  202* FUZE RELATED FIRING RECORD (NON-KEY NAME X(10) IN 200)
  203* FUZE CORRECTION (NON-KEY NAME X(10) IN 200)
  220* FUZE PHASE INFO (RG IN 200)
    221* FUZE PHASE NAME (NAME X(20) IN 220)
    222* FUZE WEAPON (NON-KEY NAME X(10) IN 220)
    223* FUZE N FIRED (NON-KEY INTEGER NUMBER 999 IN 220)
    224* FUZE N CONS (NON-KEY INTEGER NUMBER 999 IN 220)
    225* FUZE PROP CHG (NAME X(10) IN 220)
    226* FUZE SET (NAME X(10) IN 220)
    227* FUZE REVERSE (INTEGER NUMBER 99 IN 220)
    228* FUZE ODDS (INTEGER NUMBER 99 IN 220)
    240* FUZE MEASUREMENT INFO (RG IN 220)
      241* FUZE MEAS NAME (NAME X(20) IN 240)
      242* FUZE MEAS MEAN (DECIMAL NUMBER 9(5).999 IN 240)
      243* FUZE MEAS STD (DECIMAL NUMBER 999.999 IN 240)
      244* FUZE MEAS MAXIMUM (NON-KEY DECIMAL NUMBER 9(5).999 IN 240
           )
      245* FUZE MEAS MINIMUM (NON-KEY DECIMAL NUMBER 9(5).999 IN 240
           )
```

```
900*  DATA CARD INFO (RG)
  901*  COMPONENT NAME (NAME X(20) IN 900)
  902*  COMPONENT M NUMBER (NAME X(10) IN 900)
  910*  COMPONENT LOT INFO (RG IN 900)
    911*  COMPONENT LOT (NAME X(12) IN 910)
    912*  COMPONENT QUANTITY (NON-KEY INTEGER NUMBER 9(6) IN 910)
    913*  COMPONENT DATE (NON-KEY DATE IN 910)
    920*  COMPONENT TEST INFO (RG IN 910)
      921*  COMPONENT TEST NAME (NAME X(10) IN 920)
      922*  COMPONENT N (INTEGER NUMBER 9999 IN 920)
      923*  COMPONENT FAILURES (INTEGER NUMBER 9999 IN 920)
950*  COMMENT INFO (RG)
  951*  COMMENTS (NON-KEY TEXT X(80) IN 950)
  250*  FUZE ROUND BY ROUND (RG IN 200)
    251*  F ROUND NUMBER (NON-KEY INTEGER NUMBER 9(5) IN 250)
    252*  F SAMPLE NUMBER (NON-KEY INTEGER NUMBER 999 IN 250)
    253*  F PRESSURE (NON-KEY INTEGER NUMBER 9(5) IN 250)
    254*  F VELOCITY (NON-KEY INTEGER NUMBER 9999 IN 250)
    255*  F FUNCTION (NAME X(10) IN 250)
    256*  FFLAG (INTEGER NUMBER 9 IN 250)
    257*  FUZE DEFECT (NAME X(10) IN 250)
300*  PRIMER TEST INFO (RG)
  301*  PRIMER CAUSE OF REJECTION (NON-KEY TEXT X(80) IN 300)
  302*  PRIMER RELATED FIRING RECORD (NON-KEY NAME X(10) IN 300)
  303*  PRIMER CORRECTION (NON-KEY NAME X(10) IN 300)
  320*  PRIMER PHASE INFO (RG IN 300)
    321*  PRIMER PHASE NAME (NAME X(10) IN 320)
    322*  PRIMER N (NON-KEY INTEGER NUMBER 999 IN 320)
    323*  PRIMER PROP CHG (NAME X(10) IN 320)
    324*  PRIMER MALFUNCTIONS (NAME X(10) IN 320)
    330*  PRIMER PHASE MEASUREMENT INFO (RG IN 320)
      331*  PRIMER MEAS NAME (NAME X(10) IN 330)
      332*  PRIMER MEAS N (NON-KEY INTEGER NUMBER 999 IN 330)
      333*  PRIMER MEAS MEAN (DECIMAL NUMBER 9(5).999 IN 330)
      334*  PRIMER MEAS MAXIMUM (NON-KEY DECIMAL NUMBER 9(5).999 IN 3
            30)
      335*  PRIMER MEAS MINIMUM (NON-KEY DECIMAL NUMBER 9(5).999 IN 3
            30)
  350*  PRIMER SUPPORT EQUIP INFO (RG IN 300)
    351*  PRIMER EQUIP NAME (NAME X(20) IN 350)
    352*  PRIMER EQUIP MODEL (NON-KEY NAME X(10) IN 350)
    353*  PRIMER EQUIP LOT (NON-KEY NAME X(12) IN 350)
400*  IGNITION CART TEST INFO (RG)
  401*  IGN CART CAUSE OF REJECTION (NON-KEY TEXT X(80) IN 400)
  402*  IGN CART RELATED FIRING RECORD (NON-KEY NAME X(10) IN 400)
  403*  IGN CART CORRECTION (NON-KEY NAME X(10) IN 400)
  420*  IGN CART PHASE INFO (RG IN 400)
    421*  IGN CART PHASE NAME (NAME X(20) IN 420)
    422*  IGN CART N FIRED (NON-KEY INTEGER NUMBER 999 IN 420)
    423*  IGN CART N CONS (NON-KEY INTEGER NUMBER 999 IN 420)
    424*  IGN CART MALFUNCTIONS (NAME X(10) IN 420)
    425*  IGN CART UNCORR VEL MEAN (DECIMAL NUMBER 9(5).9 IN 420)
    426*  IGN CART CORR VEL MEAN (DECIMAL NUMBER 9(5).9 IN 420)
    427*  IGN CART VEL STD (NON-KEY DECIMAL NUMBER 999.99 IN 420)
```

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500*  METAL PARTS TEST INFO (RG)
  501*  MPTS CAUSE OF REJECTION (NON-KEY TEXT X(80) IN 500)
  502*  MPTS RELATED FIRING RECORD (NON-KEY NAME X(10) IN 500)
  503*  MPTS CORRECTION (NON-KEY NAME X(10) IN 500)
  520*  MPTS PHASE INFO (RG IN 500)
    521*  MPTS PHASE NAME (NAME X(20) IN 520)
    522*  MPTS N FIRED (NON-KEY INTEGER NUMBER 999 IN 520)
    523*  MPTS N CONS (NON-KEY INTEGER NUMBER 999 IN 520)
    524*  MPTS PROP CHG (NON-KEY NAME X(10) IN 520)
    525*  MPTS MALFUNCTIONS (NAME X(10) IN 520)
    530*  MPTS MEASUREMENT INFO (RG IN 520)
      531*  MPTS MEAS NAME (NAME X(10) IN 530)
      532*  MPTS MEAS UNCORR MEAN (DECIMAL NUMBER 9(5).999 IN 530)
      533*  MPTS MEAS CORR MEAN (DECIMAL NUMBER 9(5).999 IN 530)
      534*  MPTS MEAS STD (DECIMAL NUMBER 9999.999 IN 530)
      535*  MPTS MEAS MAXIMUM (NON-KEY DECIMAL NUMBER 9(5).999 IN 530
            )
      536*  MPTS MEAS MINIMUM (NON-KEY DECIMAL NUMBER 9(5).999 IN 530
            )
  550*  MPTS SUPPORT EQUIPMENT INFO (RG IN 500)
    551*  MPTS EQUIP NAME (NAME X(10) IN 550)
    552*  MPTS EQUIP MODEL (NON-KEY NAME X(10) IN 550)
    553*  MPTS EQUIP LOT (NON-KEY NAME X(10) IN 550)
4001*  AIDS (RG)
  4002*  ZZZZ (NON-KEY TEXT X(20) IN 4001)
1000*  HELP INFO (RG)
  1010*  COMMAND NAME (NAME X(10) IN 1000)
  1020*  COMMAND INFO (RG IN 1000)
    1030*  SUBCOMMAND NAME (NAME X(10) IN 1020)
    1031*  SUBCOMMAND SEQUENCE (NON-KEY INTEGER NUMBER 99 IN 1020)
    1040*  SUBCOMMAND INFO (RG IN 1020)
      1050*  SUBCOMMAND TEXT (NON-KEY TEXT X(72) IN 1040)
      1051*  SEQUENCE NUMBER (NON-KEY INTEGER NUMBER 999 IN 1040)
600*  FUZE M116 TEST INFO (RG)
  601*  M116 PHASE (NAME X(6) IN 600)
  602*  M116 BIAS MASS TIME N (NON-KEY INTEGER NUMBER 99 IN 600)
  603*  M116 BIAS MASS TIME MEAN (DECIMAL NUMBER 999.99 IN 600)
  604*  M116 BIAS MASS TIME STD (DECIMAL NUMBER 999.99 IN 600)
  605*  M116 ROTOR DELAY TIME N (NON-KEY INTEGER NUMBER 99 IN 600)
  606*  M116 ROTOR DELAY TIME MEAN (DECIMAL NUMBER 9999.99 IN 600)
  607*  M116 ROTOR DELAY TIME STD (DECIMAL NUMBER 9999.99 IN 600)
  608*  M116 ROTOR DELAY TIME -2STD (DECIMAL NUMBER 9999.99 IN 600)
  609*  M116 ROTOR DELAY TIME +2STD (DECIMAL NUMBER 9999.99 IN 600)
  610*  M116 ROTOR RESISTANCE N (NON-KEY INTEGER NUMBER 99 IN 600)
  611*  M116 ROTOR RESISTANCE MEAN (DECIMAL NUMBER 99.99 IN 600)
  612*  M116 ROTOR RESISTANCE STD (DECIMAL NUMBER 99.99 IN 600)
  613*  M116 DENT DEPTH N (NON-KEY INTEGER NUMBER 99 IN 600)
  614*  M116 DENT DEPTH MEAN (DECIMAL NUMBER 9.999 IN 600)
  615*  M116 DENT DEPTH STD (DECIMAL NUMBER 9.999 IN 600)
  625*  M116 BIAS MASS TIME LOW (INTEGER NUMBER 99 IN 600)
  626*  M116 BIAS MASS TIME HY (INTEGER NUMBER 99 IN 600)
  627*  M116 ROTOR DELAY TIME LOW (INTEGER NUMBER 99 IN 600)
  628*  M116 ROTOR RESISTANCE LOW (INTEGER NUMBER 99 IN 600)
  629*  M116 ROTOR RESISTANCE HY (INTEGER NUMBER 99 IN 600)
  630*  M116 DENT DEPTH LOW (INTEGER NUMBER 99 IN 600)
  616*  FUZE M116 R BY R (RG IN 600)
    617*  M116 SERIAL NO (NON-KEY INTEGER NUMBER 99 IN 616)
    618*  M116 BIAS MASS TIME (NON-KEY DECIMAL NUMBER 999.99 IN 616)
    619*  M116 ROTOR DELAY TIME (NON-KEY DECIMAL NUMBER 9999.99 IN 61
          6)
    620*  M116 ROTOR RESISTANCE (NON-KEY DECIMAL NUMBER 99.99 IN 616)

    621*  M116 DENT DEPTH (NON-KEY DECIMAL NUMBER 9.999 IN 616)
    622*  M116 DEFECT (NAME X(10) IN 616)
    623*  M116 RELAY (NAME X IN 616)
    624*  M116 PRE-CONDITIONING (NAME X(10) IN 616)
```

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4003*  ZZZ1 (STRING (MESSAGE FILE IS OUTPUT%PRINT/NULL SUPPRESS,STUB S
       UPPRESS/ZZZ2%))
4004*  ARIES (STRING (MESSAGE FILE IS DUMP%CONTROL%DBN IS ARIES%MESSAG
       E FILE IS OUTPUT% PRINT/NULL SUPPRESS,STUB SUPPRESS/ZZZ2%))
4000*  SUMMARY (STRING (LIST/REPEAT,TITLE D(25) COMP LOT SUMMARY,
                        L(10)TYPE,L(12)LOT NUMBER,L(10)M NUMBER,L(10)DATE
       TEST,L(11)DISPOSITION/C2,C3,  C4,C10,C8,OB C2,C3,C4 WH C3 EXIST
       S%PRINT/NAME/COUNT LOT%))
4050*  TYPESUM (STRING (LIST/REPEAT,TITLE D(25)COMP LOT SUMMARY,L(10)T
       YPE,          L(12)LOT NUMBER,L(10)M NUMBER,L(10)DATE TEST,L(11)
       DISPOSITION/C2,C3,C4,C10,C8,  OB C3,C4 WH C3 EXISTS AND C2 EQ *
       1* %))
4030*  TALLY (STRING (TALLY/EACH/C1%TALLY/EACH/C2%TALLY/EACH/C4%))
4040*  PROP (STRING (*LAB1* *1*% *LAB2* *PROP1* *PROP2* *PROP3* *PROP4
       * *PROP5*     *PROP6* PRINT/NULL SUP,NAME,STUB/ C101 WH SAME%))
4041*  LAB1 (STRING (LIST/NULL SUP,TITLE D(30)COMPONENT TEST SUMMARY,L
       (12)+LOT NUMBER,L(7)+CALIBER,L(10)+TYPE,L(10)+M NUMBER,L(8)+QUA
       NTITY,L(10)MANU-+FACTURER,L(10)INITIAL+DISP,L(10)FINAL+DISP,L(1
       0)PROVING+GROUND/C3,C1,C2,C4,C5,C6,C7,C8,C9     WH LOT EQ))
4043*  PROP1 (STRING (PRINT/GROUP/ C100 WH SAME%))
4044*  PROP2 (STRING (LIST/REPEAT SUP,TITLE D(30)PROPELLANT ACCEPTANCE
        TEST SUMMARY,L(12)+LOT NUMBER,L(10)TEST+PHASE,L(4)+TEMP,L(5)N+
       FIRED,L(4)N+CONS,L(7)CHARGE+WT,L(12)+MALFUNCTIONS,L(12)CALIBRAT
       ION+LOT,L(12)SECONDARY+LOT/ *PROP2A*))
4045*  PROP2A (STRING (C3,C131,C132,C133,C134,C135,C136,C145,C146 WH S
       AME%))
4046*  PROP3 (STRING (LIST/TITLE B(15),L(10)TEST+PHASE,L( 7)CBS VEL+
       MEAN,          L( 8)CORR VEL+  MEAN,L(5)VEL+STD,L(8)CBS PRES+MEAN
       ,L(8)PRES STD,L(10)VEL+CORRECTION,L(11)PRES+CORRECTION,L(10)WT
       +CORRECTION/C131,C140,C141,C142,C143,C144,C147,C148,C149 WH SA%
       ))
4047*  PROP4 (STRING (LIST/REPEAT SUP,TITLE D(20)PROPELLANT RECOMMENDE
       D CHARGE DATA,L(12)+LOT NUMBER,L(13)+CONFIGURATION,L(10)+ZONE,L
       ( 8)REC CHG+WT INCR,L( 8)REC CHG+WT TOTAL,L( 8)REC+VEL,L( 8)REC
       +PRESSURE/C3,C151,C152,C153,C154,C155,C156 WH SA%))
4048*  PROP5 (STRING (LIST/REPEAT SUP,TITLE D(20)PROPELLANT DIMENSION
       DATA,L(12)+LOT NUMBER,L(10)DIMENSION+NAME,L(10)DIMENSION+VALUE/
       C3,C161,C162 WH SAME%))
4049*  PROP6 (STRING (LIST/REPEAT SUP,TITLE D(20)PROPELLANT SUPPORT EQ
       UIPMENT DATA,L(12)+LOT NUMBER,L(10)EQUIPMENT+NAME,L(10)EQUIPMEN
       T+MODEL,L(10)EQUIPMENT+LOT/   C3,C171,C172,C173 WH SAME%))
4061*  FUZE1 (STRING (PRINT/GROUP/ C200 WH SAME%))
4062*  FUZE2 (STRING (LIST/REPEAT SUP,TITLE D(30)FUZE ACCEPTANCE TEST
       SUMMARY,L(12)+LOT NUMBER,L(20)+TEST PHASE,L(10)+WEAPON,L(5)N+FI
       RED,L(4)N+CONS,L(10)PROF+CHG, L(6)FUZE+SET,L(7)N+REVERSE,L(4)N+
       DUDS/C3,C221,C222,C223,C224,C225,C226,C227,C228 WH SAME%))
4063*  FUZE3 (STRING (LIST/TITLE B(15),L(20)+TEST PHASE,L(20)MEASUREME
       NT+  NAME,L(10)+  MEAN,L(10)+  STD,L(10)+MAXIMUM,L(10)+MINIMUM/
       C221,C241,C242,C243,C244,C245 WH SAME%))
4064*  FUZE4 (STRING (LIST/REPEAT SUP,TITLE D(30)FUZE DATA CARD AND CO
       MPONENT FAILURE SUMMARY,L(12)+LOT NUMBER,L(20)COMPONENT+NAME,L(
       12)COMPONENT+LOT,L(10)COMPONENT+QUANTITY,L(10)COMPONENT+DATE MA
       NU,L(10)COMPONENT+TEST NAME,L(4)N+CONS,L(4)N+FAIL/ *FL/E4A*))
4070*  IGNCART (STRING (*LAB1* *1* % *LAB2* *IGN1* *IGN2* PRINT C401 W
       H SAME%))
4071*  IGN1 (STRING (PRINT/NAME,GROUP,STUB,NULL SUP/ C400 WH SAME%))
4072*  IGN2 (STRING (LIST/REPEAT SUP,TITLE D(30)IGNITION CARTRIDGE TES
       T SUMMARY,L(12)+LOT NUMBER,L(20)+TEST PHASE,L(5)N+FIRED,L(4)N+C
       ONS,L(12)+MALFUNCTIONS,L(10)UNCORR VEL+  MEAN,L(8)CORR VEL+ MEA
       N,L(7)+VEL STD/C3,C421,C422,C423,C424,C425,C426,C427 WH SA%))
```

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1060*  HELP (STRING (PRINT/NULL SUP,INDENT,REPEAT SUP,STUB SUP,TREE/C1
       010,C1030,C1050,OB C1051,C1051 WHERE C1010 EQ HELP%PRINT/STUB,R
       EPEAT/%))
1070*  HELP1 (STRING (PRINT/NULL SUP,INDENT,REPEAT SUP,STUB SUP,TREE/
       C1010,C1030,C1050,OB C1031,C1051 WHERE C1010 EQ *1*% PRINT/STUB
       ,REPEAT/%))
1080*  HELP2 (STRING (PRINT/NULL SUP,INDENT,REPEAT SUP,STUB SUP,GROUP/
       C1010,       C1030,C1050,OB C1051 WHERE C1010 EQ *1* AND C1030
       EQ *2*%PRINT/STUB,REPEAT,TREE/%))
1090*  HELPCOMMAND (STRING (LIST/NULL SUP,TITLE D(5)ARIES COMMAND SUMM
       ARY,L(12)+COMMAND NAME,B(20);/ C1010 WHERE C1 EQ HELP%))
2050*  COMPO (STRING (DATA FILE IS TEMP% REPORT FILE IS S2RIN% PRINT/N
       ULL,REPEAT SUP,BLOCK,STUB SUPPRESS,GROUP/% QUEUE% REPEAT/PRINT
       C3,C222,C224,C322,C324 WHERE C2 EQ *DATA* AND C3 EQ *DATA*%/% T
       ERMINATE%))
2066*  A6 (STRING (REPORT FILE IS TEMP% UNLOAD/REPEAT,NULL/C901,C902,O
       B C901 WHERE SAME AND C902 EQ PROJECTILE OR C901 EQ FUZE OR C90
       1 EQ PRIMER OR C901 EQ TRACER))
4000*  DISPLAY (STRING (PRINT/NAME,STUB,GROUP,NULL SUPPRESS,REPEAT SUP
       PRESS/BY ENTRY,C2,C3,C4,C5,C6,C8,C9,C10,C11,C12,C13,C100,C160,C
       130,C200,C220,C240,C900,C910,C30,C320,C330,C400,C420,C500,C520,
       C530 WH C3 EQ *1*%*ZZZ1*%))
4065*  FUZE4A (STRING (C3,C901,C911,C912,C913,C921,C922,C923 WH SAME%)
       )
4042*  LAB2 (STRING (PRINT/NAME,STUB,INDENT,NULL SUP/C10,C11,C12,C13,
            C14,C15,C16,C17,C16,C19 WH SAME%))
4060*  FUZE (STRING (*LAB1* *1*%*LAB2* *FUZE1* *FUZE2* *FUZE3* *FUZE4*
            PRINT/NULL SUP,NAME,STUB,INDENT/ C951 WH SAME%))
2001*  FILE1 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE1
       %            DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2002*  FILE2 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE2
       %            DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2003*  FILE3 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE3
       %            DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2004*  FILE4 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE4
       %            DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2005*  FILE5 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE5
       %            DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2006*  FILE6 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE6
       %            DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2007*  FILE7 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE7
       %            DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2008*  FILE8 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE8
       %            DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2009*  FILE9 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE9
       %            DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2010*  FILE10 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       10%          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2011*  FILE11 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       11%          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2012*  FILE12 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       12%          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
```

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2013*  FILE13 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
          13%          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2014*  FILE14 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
          14%          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2015*  FILE15 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
          15%          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2016*  FILE16 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
          16%          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2017*  FILE17 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
          17%          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2018*  FILE18 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
          18%          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2019*  FILE19 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
          19%          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
2020*  FILE20 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
          20%          DESCRIBE *1*% PRINT/NULL/ *1*,OB C3 WHERE *2*%))
```

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SYSTEM RELEASE NUMBER        2.30S
DATA BASE NAME IS LAW
DEFINITION NUMBER      26
DATA BASE CYCLE        215
   1*  CALIBER (NAME X(10) WITH SOME FUTURE ADDITIONS)
   2*  TYPE (NAME X(10) WITH SOME FUTURE ADDITIONS)
   3*  LOT (NAME X(12))
   4*  P NUMBER (NAME X(10) WITH SOME FUTURE ADDITIONS)
   5*  QUANTITY (NON-KEY INTEGER NUMBER 9(6))
   6*  MANUFACTURER (NAME X(10) WITH SOME FUTURE ADDITIONS)
   7*  INITIAL DISP (NAME X(10) WITH SOME FUTURE ADDITIONS)
   8*  FINAL DISP (NAME X(10) WITH SOME FUTURE ADDITIONS)
   9*  FIRING RECORD NUMBER (NON-KEY NAME X(10))
  10*  TEST DATE (DATE)
  11*  ASSEMBLY DATE (DATE)
  12*  TEST SERIES (NON-KEY NAME X(10))
  13*  TOTAL SAMPLES (NON-KEY INTEGER NUMBER 9(5))
  14*  ITEM NOMENCLATURE (NON-KEY TEXT X(80))
  15*  CAUSE OF REJECTION (NON-KEY NAME X(10))
  16*  LOT COMMENTS (NON-KEY TEXT X(80))
  18*  SPECIFICATION (NAME X(13))
  19*  DRAWING (NAME X(10))
 100*  BALLISTIC TEST INFO (R6)
   110*  PHASE (NAME X(10) IN 100)
   111*  FLAG (INTEGER NUMBER 9 IN 100)
   112*  AMBIENT TEMP (INTEGER NUMBER 9999 IN 100)
   113*  NUMBER FIRED (INTEGER NUMBER 999 IN 100)
   114*  DATE FIRED (DATE IN 100)
   115*  APPROX TIME FIRED (NON-KEY INTEGER NUMBER 9999 IN 100)
   116*  QE (NON-KEY DECIMAL NUMBER 9(6).999 IN 100)
   117*  TARGET DISTANCE (NON-KEY INTEGER NUMBER 9(5) IN 100)
   118*  TEST REMARKS (NON-KEY TEXT X(80) IN 100)
   121*  VEL N (NON-KEY INTEGER NUMBER 999 IN 100)
   122*  VEL MEAN (DECIMAL NUMBER 9(6).999 IN 100)
   123*  VEL STD (DECIMAL NUMBER 9(6).999 IN 100)
   124*  VEL MAX (DECIMAL NUMBER 9(6).999 IN 100)
   125*  VEL MIN (DECIMAL NUMBER 9(6).999 IN 100)
   130*  N HORZ IMPACT COORD (INTEGER NUMBER 999 IN 100)
   131*  MEAN HORZ IMPACT COORD (DECIMAL NUMBER 9( ).999 IN 100)
   132*  STD HORZ IMPACT COORD (DECIMAL NUMBER 9(6, 999 IN 100)
   133*  N VERT IMPACT COORD (INTEGER NUMBER 999 IN  00)
   134*  MEAN VERT IMPACT COORD (DECIMAL NUMBER 9(6).999 IN 100)
   135*  STD VERT IMPACT COORD (DECIMAL NUMBER 9(6).999 IN 100)
   136*  MAX HORZ DISPLACEMENT (NON-KEY DECIMAL NUMBER 9(6).999 IN 100
         )
   137*  MAX VERT DISPLACEMENT (NON-KEY DECIMAL NUMBER 9(6).999 IN 100
         )
   140*  DEFECT SUMMARY (R6 IN 100)
    141*  DEFECT NAME (NAME X(10) IN 140)
     142*  NO OF OCC (INTEGER NUMBER 99 IN 140)
     143*  DEFECT NOTE (NON-KEY NAME X(10) IN 140)
```

```
      150*  K BY K INFO-LAB (RG IN 100)
        151*  ROUND NUMBER (NON-KEY INTEGER NUMBER 9999 IN 150)
        152*  HANGFIRE TIME (NON-KEY DECIMAL NUMBER 9(6).999 IN 150)
        153*  VEL (NON-KEY DECIMAL NUMBER 9(6).999 IN 150)
        154*  HO COORD (NON-KEY DECIMAL NUMBER 9(6).999 IN 150)
        155*  VERT COORD (NON-KEY DECIMAL NUMBER 9(6).999 IN 150)
        156*  IMPACT FUNCTION (NAME X(10) IN 150)
        157*  WIND VELOCITY (NON-KEY INTEGER NUMBER 9999 IN 150)
        158*  WIND DIRECTION (NON-KEY INTEGER NUMBER 9999 IN 150)
        159*  PENETRATION (NAME X(5) IN 150)
        160*  EXIT HOLE AREA (NON-KEY DECIMAL NUMBER 9(6).999 IN 150)
        161*  WATER CONTENT (NON-KEY INTEGER NUMBER 9999 IN 150)
        162*  DEFECT (NAME X(10) IN 150)
        163*  RELAB (INTEGER NUMBER 9 IN 150)
    900*  DATA CARD INFO (RG)
      901*  COMPONENT NAME (NAME X(10) IN 900)
      902*  COMPONENT R NUMBER (NAME X(10) IN 900)
      910*  COMPONENT LOT INFO (RG IN 900)
        911*  COMPONENT LOT (NAME X(12) IN 910)
        912*  COMPONENT QUANTITY (NON-KEY INTEGER NUMBER 9(6) IN 910)
        913*  COMPONENT DATE (DATE IN 910)
    920*  COMMENT INFO (RG)
      921*  COMMENTS (NON-KEY TEXT X(80) IN 920)
  4001*  AIDS (RG)
    4002*  ZZZ2 (NON-KEY TEXT X(20) IN 4001)
  200*  STATIC TEST INFO-PEN (RG)
    201*  N-SP (NON-KEY INTEGER NUMBER 9(7) IN 200)
    202*  MEAN-SP (DECIMAL NUMBER 99.99 IN 200)
    203*  STD-SP (DECIMAL NUMBER 99.99 IN 200)
    204*  MIN-SP (DECIMAL NUMBER 99.99 IN 200)
    205*  MAX-SP (DECIMAL NUMBER 99.99 IN 200)
    206*  K8-SP (DECIMAL NUMBER 99.99 IN 200)
    207*  K24-SP (DECIMAL NUMBER 99.99 IN 200)
    210*  K BY K INFO-STATIC PEN (RG IN 200)
      211*  PEN-SP (NON-KEY DECIMAL NUMBER 99.99 IN 210)
      212*  MFLAG-SP (NAME X IN 210)
  4003*  ZZZ1 (STRING (MESSAGE FILE IS OUTPUT%PRINT/NULL SUPPRESS,STUB S
         UPPRESS/ZZZZ%))
  4004*  ARIES (STRING (MESSAGE FILE IS DUMP%CONTROL%DBN IS ARIES%MESSAG
         E FILE IS OUTPUT% PRINT/NULL SUPPRESS,STUB SUPPRESS/ZZZZ%))
  4005*  DISPLAY (STRING (PRINT/NAME,STUB,GROUP,NULL SUPPRESS,REPEAT SUP
         PRESS/BY ENTRY,C1,C2,C3,C4,C5,C6,C7,C9,C10,C12,C13,C14,C15 WH C
         3 EQ *1*%*ZZZ1*%))
  4006*  COMPLOT (STRING (PRINT/NAME,STUB,GROUP,NULL SUPPRESS,REPEAT SUP
         PRESS/BY ENTRY,C1,C2,C3,C4,C5,C6,C7,C9,C10,C12,C13,C14,C15,C170
         ,C172 WH C3 EQ *1*%*ZZZ1*%))
  4007*  CRLOTS (STRING (PRINT/NAME,STUB,GROUP,NULL SUPPRESS,REPEAT SUPP
         RESS/BY ENTRY,C2,C3,C5,C7,C10 WH C173 EQ *1*%*ZZZ1*%))
  4008*  CSEARCH (STRING (LIST/REPEAT SUP,TITLE D(20)*1*,CR*LOT NUMBER,B
         (3),L(6)CR*QUANT,B(5),L(10)CR DISP,B(3),L(10)CR TEST,DATE,B(2),
         L(10),COMPONENT*QUANT/C3,C5,C7,C10,C173,OB C3,C10 WH C173 EQ *1
         *%*ZZZ1*%))
```

```
4009*  SUMMARY (STRING (PRINT/NAME,STOP,GROUP,NULL SUPPRESS,REPEAT SUP
       PRESS/BY EN(RY,C1,C2,C3,C4,C5,C6,C7,C9,C10,C12,C13,C14,C15,C100
       ,C130 WH C3 EQ *1*%*ZZZ1*%))
3000*  M72LIST (STRING (LIST/REPEAT SUP,TITLE D(20)*1*,F(60),,*H1**H2*
       /C3,C10,C7,C6,C110,C141,C142,C121,C122,C123,C130,C131,C132,C133
       ,C134,C135,OB C3,C110 WH C4 EQ  M73*M73XX AND *1*%))
3003*  M73LIST (STRING (LIST/REPEAT SUP,TITLE D(20)*1*,F(60),,*H1**H2*
       /C3,C10,C7,C6,C110,C141,C142,C121,C122,C123,C130,C131,C132,C133
       ,C134,C135,OB C3,C110 WH C4 EQ  M73*M73XX AND *1*%))
3001*  H1 (STRING (L(11)LOT,B(1),L(10)TEST+DATE,B(1),L(3)INI+USP,B(1),
       L(8)FINAL+DISP,B(1),L(10)TEST+PHASE,L(1),L(10)DEFECT+TYPE,B(1),
       L(2)NO+OF,B(2),))
3002*  H2 (STRING (    R(2)+-N,B(1),R(9)VEL+MEAN,B(1),R(9)+STD-,B(2),R
       (2)+-N,B(1), R(9)HOR+MEAN,B(1),R(9)+STD-,B(2),R(2)+-N,B(1),R(9)
       VERT+MEAN,B(1),R(9)+STD-))
3005*  M16LIST (STRING (LIST/REPEAT SUP,TITLE D(20)*1*,F(60)    ,L(10)
       LOT,L(4)DISP, R(3)N,R(5)MEAN,R(5)STD,R(5)MIN,R(5)MAX,R(5)K-S,R(
       5)K-24/C3,C7,C201,C202,C203,  C204,C205,C206,C207,OB C3 WH C4
       EQ M16 AND *1*%))
3010*  M72LOT (STRING (LIST/REPEAT SUP,TITLE D(20)*1*,L(12),C1,L(8)QUA
       NTITY,L(4)INIT+DISP,B(3),L(10)FINAL DISP,L(10)ASSEMBLY+DATE,L(1
       0)TEST DATE,L(10)TEST+SERIES, L(20)CAUSE OF REJECTION,L(20)COMM
       ENTS/C3,C5,C7,C6,C11,C10,C12,C15,C16 WH C4 EQ M72*M72AC AND C3
       EQ *1*%*GPAP*))
3011*  GPAP (STRING (*GPAPA**GPAPB**GPAPC**GPAPD*))
3012*  GPAPA (STRING (LIST/REPEAT SUP,TITLE L(10)+PHASE,R(7)+SAMPLES,R
       (5)+VEL+N, B(1),R(9)+VEL+ MEAN,B(1),R(9)+VEL +STD,R(5)+HOR+ N,B
       (1),R(9)+HOR +MEAN,B(1),R(9)+HOR+ STD,R(2),R(9)+HOR +MAX DISP,R
       (4)+VERT+ N,B(1),R(9)+VERT+ MEAN,B(1),R(9)+VERT +STD,*GPAPA1*))

3016*  GPAPA1 (STRING (B(2),R(9)+VERT+ MAX DISP/
                                C110,C113,C121,C122,C123,C13?,C131,C132,C1
       33,C133,C134,C135,C137,OB C110 WH SA%))
3013*  GPAPB (STRING (LIST/REPEAT SUP,TITLE L(10)+PHASE,L(10)+DEFECT,F
       (5)+NO +OCC,L(10)+COMMENTS/C110,C141,C142,C143,OB C110,C141 WH
       SA%))
3014*  GPAPC (STRING ( LIST/REPEAT SUP,TITLE L(15)+LOT,L(10)+COMPONENT
       ,L(20)+COMPONENT LOT,R(9)+QUANTITY,L(10)+DATE OF +MANUFACTURE/
       C3,C171,C173,C174,C175,OB C171,C173 WH SA%))
3015*  GPAPD (STRING ( LIST/REPEAT SUP,TITLE L(20)ROUND BY NOUND,F(60)
       ,L(15)LOT,L(10)PHASE,R(5)ROUND,R(10)HANGFIRE+TIME,R(10)VELOCIT
       Y,R(10)HOR+IMPACT,R(10)VERT+IMPACT,L(10)IMPACT+FUNCTION,L(10)PE
       NETRATION, L(10)DEFECT/*GPAPD1*))
3017*  GPAPD1 (STRING (                                    C3,C110,C15
       1,C152,C153,C154,C155,C156,C159,C162,OB C110 WH SA%))
```

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2001*  FILE1 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE1
       %          DESCRIBE *1*% PRINT/NULL/ *1*,OR C3 WHERE *2*%))
2002*  FILE2 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE2
       %          DESCRIBE *1*% PRINT/NULL/ *1*,OR C3 WHERE *2*%))
2003*  FILE3 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE3
       %          DESCRIBE *1*% PRINT/NULL/ *1*,OR C3 WHERE *2*%))
2004*  FILE4 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE4
       %          DESCRIBE *1*% PRINT/NULL/ *1*,OR C3 WHERE *2*%))
2005*  FILE5 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE5
       %          DESCRIBE *1*% PRINT/NULL/ *1*,OR C3 WHERE *2*%))
2006*  FILE6 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE6
       %          DESCRIBE *1*% PRINT/NULL/ *1*,OR C3 WHERE *2*%))
2007*  FILE7 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE7
       %          DESCRIBE *1*% PRINT/NULL/ *1*,OR C3 WHERE *2*%))
2008*  FILE8 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE8
       %          DESCRIBE *1*% PRINT/NULL/ *1*,OR C3 WHERE *2*%))
2009*  FILE9 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE9
       %          DESCRIBE *1*% PRINT/NULL/ *1*,OR C3 WHERE *2*%))
2010*  FILE10 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       10%          DESCRIBE *1*% PRINT/NULL/ *1*,OR C3 WHERE *2*%))
2011*  FILE11 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       11%          DESCRIBE *1*% PRINT/NULL/ *1*,OR C3 WHERE *2*%))
2012*  FILE12 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       12%          DESCRIBE *1*% PRINT/NULL/ *1*,OR C3 WHERE *2*%))
2013*  FILE13 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       13%          DESCRIBE *1*% PRINT/NULL/ *1*,OR C3 WHERE *2*%))
2014*  FILE14 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       14%          DESCRIBE *1*% PRINT/NULL/ *1*,OR C3 WHERE *2*%))
2015*  FILE15 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       15%          DESCRIBE *1*% PRINT/NULL/ *1*,OR C3 WHERE *2*%))
2016*  FILE16 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       16%          DESCRIBE *1*% PRINT/NULL/ *1*,OR C3 WHERE *2*%))
2017*  FILE17 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       17%          DESCRIBE *1*% PRINT/NULL/ *1*,OR C3 WHERE *2*%))
2018*  FILE18 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       18%          DESCRIBE *1*% PRINT/NULL/ *1*,OR C3 WHERE *2*%))
2019*  FILE19 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       19%          DESCRIBE *1*% PRINT/NULL/ *1*,OR C3 WHERE *2*%))
2020*  FILE20 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       20%          DESCRIBE *1*% PRINT/NULL/ *1*,OR C3 WHERE *2*%))
```

```
SYSTEM RELEASE NUMBER        2.30S
DATA BASE NAME IS WEAPON
DEFINITION NUMBER            3
DATA BASE CYCLE              1
    1*  CALIBER (NAME X(10) WITH SOME FUTURE ADDITIONS)
    2*  MODEL NUMBER (NAME X(10) WITH SOME FUTURE ADDITIONS)
    3*  TUBE NUMBER (NAME X(10) WITH SOME FUTURE ADDITIONS)
    4*  GUN NUMBER (NAME X(10))
    5*  ROUNDS FIRED (INTEGER NUMBER 9(6))
    6*  MANUFACTURER (NAME X(10) WITH SOME FUTURE ADDITIONS)
    7*  MAIN BORE START (NON-KEY DECIMAL NUMBER 9(6).999)
    8*  MAIN BORE FINISH (NON-KEY DECIMAL NUMBER 9(6).999)
    9*  STAR GAGE ALLOWED (NAME X(10))
   10*  PROVING GROUND (NAME X(10))
   11*  TEST DATE (DATE)
  100*  RIFLED WEAPON INFO (RG)
    101*  CHAMBER START (NON-KEY DECIMAL NUMBER 9(6).999 IN 100)
    102*  CHAMBER FINISH (NON-KEY DECIMAL NUMBER 9(6).999 IN 100)
    103*  DEPTH OF BREECH RECESS (NON-KEY DECIMAL NUMBER 9(6).999 IN 10
          0)
    104*  NUMBER OF LANDS GROOVES (INTEGER NUMBER 999 IN 100)
    105*  LENGTH OF TUBE (DECIMAL NUMBER 9(6).999 IN 100)
    106*  BASIC LANDS DIAMETER (NON-KEY DECIMAL NUMBER 9(6).999 IN 100)
    107*  BASIC GROOVES DIAMETER (NON-KEY DECIMAL NUMBER 9(6).999 IN 10
          0)
    120*  TUBE MEASUREMENT INFO (RG IN 100)
      121*  DISTANCE FROM REAR FACE OF BREECH (NON-KEY DECIMAL NUMBER 9
            (6).999 IN 120)
      122*  DISTANCE FROM MUZZLE FACE (NON-KEY DECIMAL NUMBER 9(6).999
            IN 120)
      123*  DISTANCE FROM REAR FACE OF TUBE (NON-KEY DECIMAL NUMBER 9(6
            ).999 IN 120)
      124*  VERTICAL LANDS DIAMETER (NON-KEY DECIMAL NUMBER 9(6).999 IN
             120)
      125*  HORIZ LANDS DIAMETER (NON-KEY DECIMAL NUMBER 9(6).999 IN 12
            0)
      126*  VERTICAL GROOVES DIAMETER (NON-KEY DECIMAL NUMBER 9(6).999
            IN 120)
      127*  HORIZ GROOVES DIAMETER (NON-KEY DECIMAL NUMBER 9(6).999 IN
            120)
    140*  PULLOVER MEASUREMENT INFO (RG IN 100)
      141*  PO DISTANCE FROM REAR FACE OF BREECH (NON-KEY DECIMAL NUMBE
            R 9(6).999 IN 140)
      142*  PO DISTANCE FROM REAR FACE OF TUBE (NON-KEY DECIMAL NUMBER
            9(6).999 IN 140)
      143*  PO VERTICAL LANDS DIAMETER (NON-KEY DECIMAL NUMBER 9(6).999
             IN 140)
      144*  PO HORIZ LANDS DIAMETER (NON-KEY DECIMAL NUMBER 9(6).999 IN
             140)
      145*  PO VERTICAL GROOVES DIAMETER (NON-KEY DECIMAL NUMBER 9(6).9
            99 IN 140)
      146*  PO HORIZ GROOVES DIAMETER (NON-KEY DECIMAL NUMBER 9(6).999
            IN 140)
```

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160*  CHAMBER MEASUREMENT INFO (RG IN 100)
  161*  CH DISTANCE FROM REAR FACE OF BREECH (NON-KEY DECIMAL NUMBE
        R 9(6).999 IN 160)
  162*  CH DISTANCE FROM MUZZLE FACE (NON-KEY DECIMAL NUMBER 9(6).9
        99 IN 160)
  163*  CH DISTANCE FROM REAR FACE OF TUBE (NON-KEY DECIMAL NUMBER
        9(6).999 IN 160)
  164*  CHAMBER BASIC DIAMETER (NON-KEY DECIMAL NUMBER 9(6).999 IN
        160)
  165*  CHAMBER ZERO (NON-KEY DECIMAL NUMBER 9(6).999 IN 160)
  166*  CH VERTICAL GAUGE (NON-KEY DECIMAL NUMBER 9(6).999 IN 160)
  167*  CH HORIZ GAUGE (NON-KEY DECIMAL NUMBER 9(6).999 IN 160)
200*  SMOOTH BORE WEAPON INFO (RG)
  201*  BASIC SMOOTH BORE DIAMETER (NON-KEY DECIMAL NUMBER 9(6).999 I
        N 200)
  220*  SMOOTH BORE MUZZLE INFO (RG IN 200)
    221*  SB DISTANCE FROM MUZZLE FACE (NON-KEY DECIMAL NUMBER 9(6).9
          99 IN 220)
    222*  SB VERTICAL DIAMETER (NON-KEY DECIMAL NUMBER 9(6).999 IN 22
          0)
    223*  SB HORIZ DIAMETER (NON-KEY DECIMAL NUMBER 9(6).999 IN 220)
300*  COMMENT INFO (RG)
  301*  COMMENTS (NON-KEY TEXT X(80) IN 300)
1000*  HELP INFO (RG)
  1010*  COMMAND NAME (NAME X(10) IN 1000)
  1020*  COMMAND INFO (RG IN 1000)
    1030*  SUBCOMMAND NAME (NAME X(10) IN 1020)
    1031*  SUBCOMMAND SEQUENCE (NON-KEY INTEGER NUMBER 99 IN 1020)
    1040*  SUBCOMMAND INFO (RG IN 1020)
      1050*  SUBCOMMAND TEXT (NON-KEY TEXT X(72) IN 1040)
      1051*  SEQUENCE NUMBER (NON-KEY INTEGER NUMBER 999 IN 1040)
4000*  SUMMARY (STRING (LIST/REPEAT SUP,TITLE D(20)WEAPON DATA BASE SU
       MMARY,L(7)+CALIBER,L(10)MODEL+NUMBER,L(10)TUBE+NUMBER,L(10)GUN+
       NUMBER,L(10)ROUNDS+FIRED/C1,  C2,C3,C4,C5,OB C1,C2,C3,C4,C5 WH
       C1 EXISTS%))
4010*  RIFLED (STRING (PRINT/NULL SUP/%*WEAPON1* *1* AND C4 E6 *2*% *R
       IFLED1*        *TUBE* *PULLOVER* *CHAMBER* PRINT/NAME,NULL SUP,S
       TUB/C301 WH SAME%))
4001*  WEAPON1 (STRING (LIST/TITLE D(30)STARGAGE INSPECTION SUMMARY,L(
       7)+CALIBER,L(10)MODEL+NUMBER,L(10)TUBE+NUMBER,L(10)GUN+NUMBER,L
       (6)ROUNDS+FIRED,L(10) MANU-+FACTURER,L(10)MAIN BORE+START,L(10)
       MAIN BORE+FINISH,L(10)STAR GAGE+NUMBER,L(10)PROVING+GROUND/*WEA
       PON1A*))
4002*  WEAPON1A (STRING (C1,C2,C3,C4,C5,C6,C7,C8,C9,C10 WH C3 EQ))
4011*  RIFLED1 (STRING (PRINT/NAME,NULL SUP,INDENT,STUB,GROUP/C100 WH
       SAME%))
4012*  TUBE (STRING (LIST/REPEAT SUP,TITLE D(30)TUBE MEASUREMENT DATA,
       L(10)TUBE+NUMBER,L(10)RNDS+FIRED,L(11)DIST REAR+FACE BREECH,E(2
       ),L(10)DIST FROM+MUZ FACE,L(10)DIST REAR+FACE TUBE,L(10)VERTICA
       L+LANDS DIAM,L(10)HORIZ+LANDS DIAM,L(11)VERTICAL+GROOVE DIAM,*T
       UBE1A*))
4013*  TUBE1A (STRING (E(2),L(11)HORIZ+GROOVE DIAM/C3,C5,C121,C122,C123
       ,C124,C125,  C126,C127 WH SAME%))
4014*  PULLOVER (STRING (LIST/REPEAT SUP,TITLE D(30)PULLOVER MEASUREME
       NT DATA,L(10)TUBE+NUMBER,L(10)RNDS+FIRED,L(16)PO DISTANCE+REAR
       FACE BREECH,L(14)PO DISTANCE+REAR FACE TUBE,L(10)PC VENT+LANDS
       DIAM,L(10)PC HORIZ+LANDS DIAM,L(11)PO VERTICAL+GROOVES DIAM,*PU
       LLOVER1A*))
4015*  PULLOVER1A (STRING (L(11)PO HORIZ+GROOVE DIAM/C3,C5,C141,C142,C1
       43,C144,C145,C146 WH SAME%))
```

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4016* CHAMBER (STRING (LIST/REPEAT SUP,TITLE D(30)CHAMBER MEASUREMENT
      DATA,L(10)TUBE+NUMBER,L(10)RNDS+FIRED,L(16)CHAMBER DIST+REAR F
      ACE BREECH,L(12)CHAMBER DIST+PUZZLE FACE,L(14)CHAMBER DIST+REAR
       FACE TUBE,L(10)CHAMBER+BASIC DIAM,L(10)CHAMBER+ ZERO,*CHAMBERA
      *))
4017* CHAMBERA (STRING (L(10)CHAMBER+VERT GAUGE,L(11)CHAMBER+HORIZ GA
      UGE/ C3,C5,  C161,C162,C163,C164,C165,C166,C167 WH SAME%))
4020* SMOOTH (STRING (PRINT/NULL SUP/% *WEAPON1* *1* AND C4 EQ *2*1 *
      SMOOTH1*      *SMOOTH2* PRINT/NAME,NULL SUP,STUB/ C201 WH SAME%)
      )
4021* SMOOTH1 (STRING (PRINT/NAME,NULL SUP,INDENT,STUB,GROUP/C201 WH
      SAME%))
4022* SMOOTH2 (STRING (LIST/REPEAT SUP,TITLE D(20)SMOOTH BORE PUZZLE
      DATA,L(10)TUBE+NUMBER,L(10)RNDS+FIRED,L(11)DIST FROM+PUZZLE FAC
      E,L(10)VERTICAL+DIAMETER,L(10)HORIZ+DIAMETER/C3,C5,C221,C222,C2
      25 WH SAME%))
2001* FILE1 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE1
      %              DESCRIBE *1*%PRINT *1* WHERE *2*%))
2002* FILE2 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE2
      %              DESCRIBE *1*%PRINT *1* WHERE *2*%))
2003* FILE3 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE3
      %              DESCRIBE *1*%PRINT *1* WHERE *2*%))
2004* FILE4 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE4
      %              DESCRIBE *1*%PRINT *1* WHERE *2*%))
2005* FILE5 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE5
      %              DESCRIBE *1*%PRINT *1* WHERE *2*%))
2006* FILE6 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE6
      %              DESCRIBE *1*%PRINT *1* WHERE *2*%))
2007* FILE7 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE7
      %              DESCRIBE *1*%PRINT *1* WHERE *2*%))
2008* FILE8 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE8
      %              DESCRIBE *1*%PRINT *1* WHERE *2*%))
2009* FILE9 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE9
      %              DESCRIBE *1*%PRINT *1* WHERE *2*%))
2010* FILE10 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
      10%            DESCRIBE *1*%PRINT *1* WHERE *2*%))
2011* FILE11 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
      11%            DESCRIBE *1*%PRINT *1* WHERE *2*%))
2012* FILE12 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
      12%            DESCRIBE *1*%PRINT *1* WHERE *2*%))
2013* FILE13 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
      13%            DESCRIBE *1*%PRINT *1* WHERE *2*%))
2014* FILE14 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
      14%            DESCRIBE *1*%PRINT *1* WHERE *2*%))
2015* FILE15 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
      15%            DESCRIBE *1*%PRINT *1* WHERE *2*%))
2016* FILE16 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
      16%            DESCRIBE *1*%PRINT *1* WHERE *2*%))
2017* FILE17 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
      17%            DESCRIBE *1*%PRINT *1* WHERE *2*%))
2018* FILE18 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
      18%            DESCRIBE *1*%PRINT *1* WHERE *2*%))
2019* FILE19 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
      19%            DESCRIBE *1*%PRINT *1* WHERE *2*%))
2020* FILE20 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
      20%            DESCRIBE *1*%PRINT *1* WHERE *2*%))
1060* HELP (STRING (PRINT/NULL SUP,INDENT,REPEAT SUP,STUB SUP,TREE/C1
      010,C1030,C1050,OR C1051,C1051 WHERE C1010 EQ HELP*PRINT/STUB,R
      EPEAT/*))
1070* HELP1 (STRING (PRINT/NULL SUP,INDENT,REPEAT SUP,STUB SUP,TREE/
      C1010,C1030,C1050,OR C1051,C1051 WHERE C1010 EQ *1*% PRINT/STUB
      ,REPEAT/%))
1080* HELP2 (STRING (PRINT/NULL SUP,INDENT,REPEAT SUP,STUB SUP,GROUP/
      C1010,         C1030,C1050,OR C1051 WHERE C1010 EQ *1* AND C1020
      EQ *2*%PRINT/STUB,REPEAT,TREE/%))
1090* HELPCOMMAND (STRING (LIST/NULL SUP,TITLE D(5)ARIES COMMAND SUMM
      ARY,L(12)+COMMAND NAME,B(20)/ C1010 WHERE C1 EQ HELP*))
```

```
DATA BASE NAME IS T#075
DEFINITION NUMBER      25
DATA BASE CYCLE       844
    1*  CALIBER (NAME X(10) WITH SOME FUTURE ADDITIONS)
    2*  TYPE (NAME X(10) WITH SOME FUTURE ADDITIONS)
    3*  LOT (NAME X(12))
    4*  P NUMBER (NAME X(10) WITH SOME FUTURE ADDITIONS)
    5*  QUANTITY (NON-KEY INTEGER NUMBER 9(6))
    6*  MANUFACTURER (NAME X(10) WITH SOME FUTURE ADDITIONS)
    7*  INITIAL DISP (NAME X(10) WITH SOME FUTURE ADDITIONS)
    8*  FINAL DISP (NAME X(10) WITH SOME FUTURE ADDITIONS)
   11*  ASSEMBLY DATE (DATE)
   10*  TYPE TEST (NON-KEY NAME X(10))
    9*  PROVING GROUND (NAME X(10) WITH SOME FUTURE ADDITIONS)
   12*  ITEM NOMENCLATURE (NON-KEY TEXT X(80))
   13*  BIN-REEL (NON-KEY NAME X(10))
   14*  FIRING RECORD NUMBER (NON-KEY NAME X(10))
   15*  CAUSE OF REJECTION (NON-KEY TEXT X(80))
   19*  DRAWING (NAME X(10))
   18*  SPECIFICATION (NAME X(13))
  100*  BALLISTIC TEST INFO-RADAR (R6)
  101*  PHASE (NAME X(10) IN 100)
  102*  DATE FIRED (DATE IN 100)
  103*  BE (NON-KEY DECIMAL NUMBER 9(6).999 IN 100)
  106*  TIFM N (NON-KEY INTEGER NUMBER 999 IN 100)
  107*  TIFM MEAN (DECIMAL NUMBER 9(6).999 IN 100)
  108*  TIFM STD (DECIMAL NUMBER 9(6).999 IN 100)
  109*  IR POSITION (NON-KEY DECIMAL NUMBER 9(6).999 IN 100)
  110*  TTIR N (NON-KEY INTEGER NUMBER 999 IN 100)
  111*  TTIR MEAN (DECIMAL NUMBER 9(6).999 IN 100)
  112*  TTIR STD (DECIMAL NUMBER 9(6).999 IN 100)
  113*  IR VELOCITY N (NON-KEY INTEGER NUMBER 999 IN 100)
  114*  IR VELOCITY MEAN (DECIMAL NUMBER 9(6).999 IN 100)
  115*  IR VELOCITY STD (DECIMAL NUMBER 9(6).999 IN 100)
  116*  TIME TO BO N (NON-KEY INTEGER NUMBER 999 IN 100)
  117*  TIME TO BO MEAN (DECIMAL NUMBER 9(6).999 IN 100)
  118*  TIME TO BO STD (DECIMAL NUMBER 9(6).999 IN 100)
  119*  BO RANGE N (NON-KEY INTEGER NUMBER 999 IN 100)
  120*  BO RANGE MEAN (DECIMAL NUMBER 9(6).999 IN 100)
  121*  BO RANGE STD (DECIMAL NUMBER 9(6).999 IN 100)
  122*  BO EL N (NON-KEY INTEGER NUMBER 999 IN 100)
  123*  BO EL MEAN (DECIMAL NUMBER 9(6).999 IN 100)
  124*  BO EL STD (DECIMAL NUMBER 9(6).999 IN 100)
  125*  BO LAT DEFL N (NON-KEY INTEGER NUMBER 999 IN 100)
  126*  BO LAT DEFL MEAN (DECIMAL NUMBER 9(6).999 IN 100)
  127*  BO LAT DEFL STD (DECIMAL NUMBER 9(6).999 IN 100)
  128*  BO VELOCITY N (NON-KEY INTEGER NUMBER 999 IN 100)
  129*  BO VELOCITY MEAN (DECIMAL NUMBER 9(6).999 IN 100)
  130*  BO VELOCITY NOBS (DECIMAL NUMBER 9(6).999 IN 100)
```

```
140*  500M EL N (NON-KEY INTEGER NUMBER 999 IN 100)
141*  500M EL MEAN (DECIMAL NUMBER 9(6).999 IN 100)
142*  500M EL STD (DECIMAL NUMBER 9(6).999 IN 100)
143*  500M LAT DEFL N (NON-KEY INTEGER NUMBER 999 IN 100)
144*  500M LAT DEFL MEAN (DECIMAL NUMBER 9(6).999 IN 100)
145*  500M LAT DEFL STD (DECIMAL NUMBER 9(6).999 IN 100)
146*  500M VELOCITY N (NON-KEY INTEGER NUMBER 999 IN 100)
147*  500M VELOCITY MEAN (DECIMAL NUMBER 9(6).999 IN 100)
148*  500M VELOCITY STD (DECIMAL NUMBER 9(6).999 IN 100)
149*  500M ELAPSED TIME N (NON-KEY INTEGER NUMBER 999 IN 100)
150*  500M ELAPSED TIME MEAN (DECIMAL NUMBER 9(6).999 IN 100)
151*  500M ELAPSED TIME STD (DECIMAL NUMBER 9(6).999 IN 100)
152*  500M CPE (NON-KEY DECIMAL NUMBER 9(6).999 IN 100)
153*  500M PERCENT WITHIN (DECIMAL NUMBER 9(6).999 IN 100)
154*  500M TARGET WIDTH (NON-KEY DECIMAL NUMBER 9(6).999 IN 100)
155*  500M TARGET HEIGHT (NON-KEY DECIMAL NUMBER 9(6).999 IN 100)
156*  500M VERT TARGET CENTER (NON-KEY DECIMAL NUMBER 9(6).999 IN 1
      00)
160*  800M EL N (NON-KEY INTEGER NUMBER 999 IN 100)
161*  800M EL MEAN (DECIMAL NUMBER 9(6).999 IN 100)
162*  800M EL STD (DECIMAL NUMBER 9(6).999 IN 100)
163*  800M LAT DEFL N (NON-KEY INTEGER NUMBER 999 IN 100)
164*  800M LAT DEFL MEAN (DECIMAL NUMBER 9(6).999 IN 100)
165*  800M LAT DEFL STD (DECIMAL NUMBER 9(6).999 IN 100)
166*  800M VELOCITY N (NON-KEY INTEGER NUMBER 999 IN 100)
167*  800M VELOCITY MEAN (DECIMAL NUMBER 9(6).999 IN 100)
168*  800M VELOCITY STD (DECIMAL NUMBER 9(6).999 IN 100)
169*  800M ELAPSED TIME N (NON-KEY INTEGER NUMBER 999 IN 100)
170*  800M ELAPSED TIME MEAN (DECIMAL NUMBER 9(6).999 IN 100)
171*  800M ELAPSED TIME STD (DECIMAL NUMBER 9(6).999 IN 100)
172*  800M CPE (NON-KEY DECIMAL NUMBER 9(6).999 IN 100)
173*  800M PERCENT WITHIN (DECIMAL NUMBER 9(6).999 IN 100)
174*  800M TARGET WIDTH (NON-KEY DECIMAL NUMBER 9(6).999 IN 100)
175*  800M TARGET HEIGHT (NON-KEY DECIMAL NUMBER 9(6).999 IN 100)
176*  800M VERT TARGET CENTER (NON-KEY DECIMAL NUMBER 9(6).999 IN 1
      00)
179*  IMPACT EL N (NON-KEY INTEGER NUMBER 999 IN 100)
180*  IMPACT EL MEAN (DECIMAL NUMBER 9(6).999 IN 100)
181*  IMPACT EL STD (NON-KEY DECIMAL NUMBER 9(6).999 IN 100)
182*  IMPACT LAT DEFL N (NON-KEY INTEGER NUMBER 999 IN 100)
183*  IMPACT LAT DEFL MEAN (DECIMAL NUMBER 9(6).999 IN 100)
184*  IMPACT LAT DEFL STD (NON-KEY DECIMAL NUMBER 9(6).999 IN 100)
185*  IMPACT VELOCITY N (NON-KEY INTEGER NUMBER 999 IN 100)
186*  IMPACT VELOCITY MEAN (DECIMAL NUMBER 9(6).999 IN 100)
187*  IMPACT VELOCITY STD (NON-KEY DECIMAL NUMBER 9(6).999 IN 100)
188*  IMPACT RANGE N (NON-KEY INTEGER NUMBER 999 IN 100)
189*  IMPACT RANGE MEAN (DECIMAL NUMBER 9(6).999 IN 100)
190*  IMPACT RANGE STD (DECIMAL NUMBER 9(6).999 IN 100)
191*  TIME TO IMPACT N (NON-KEY INTEGER NUMBER 999 IN 100)
192*  TIME TO IMPACT MEAN (NON-KEY DECIMAL NUMBER 9(6).999 IN 100)
193*  TIME TO IMPACT STD (NON-KEY DECIMAL NUMBER 9(6).999 IN 100)
198*  DATA SET NUMBER (NON-KEY INTEGER NUMBER 999 IN 100)
199*  NUMBER INVALID RDS (NON-KEY INTEGER NUMBER 999 IN 100)
```

```
200*  R B)/R INFO-RADAR (RG IN 100)
  201*  ROUND NUMBER (INTEGER NUMBER 999 IN 200)
  202*  TTFM (NON-KEY DECIMAL NUMBER 9(6).999 IN 200)
  203*  TTIR (NON-KEY DECIMAL NUMBER 9(6).999 IN 200)
  205*  IR VELOCITY (NON-KEY DECIMAL NUMBER 9(6).999 IN 200)
  206*  TTBG (NON-KEY DECIMAL NUMBER 9(6).999 IN 200)
  207*  BG RANGE (NON-KEY DECIMAL NUMBER 9(6).999 IN 200)
  208*  BG ELEV (NON-KEY DECIMAL NUMBER 9(6).999 IN 200)
  209*  BG DEFL (NON-KEY DECIMAL NUMBER 9(6).999 IN 200)
  210*  BG VEL (NON-KEY DECIMAL NUMBER 9(6).999 IN 200)
  211*  ROCKET WEIGHT (DECIMAL NUMBER 9(6).999 IN 200)
  212*  WIND VEL (NON-KEY INTEGER NUMBER 999 IN 200)
  213*  WIND DIR (NON-KEY INTEGER NUMBER 9999 IN 200)
  214*  ROCKET MOTOR RESISTANCE (DECIMAL NUMBER 9(6).999 IN 200)
  215*  FUZE ACTION (NON-KEY NAME X(5) IN 200)
  220*  500M EL (NON-KEY DECIMAL NUMBER 9(6).999 IN 200)
  222*  500M LAT DEFL (NON-KEY DECIMAL NUMBER 9(6).999 IN 200)
  224*  500M ELAPSED TIME (NON-KEY DECIMAL NUMBER 9(6).999 IN 200)
  225*  500M VELOCITY (NON-KEY DECIMAL NUMBER 9(6).999 IN 200)
  230*  800M EL (NON-KEY DECIMAL NUMBER 9(6).999 IN 200)
  232*  800M LAT DEFL (NON-KEY DECIMAL NUMBER 9(6).999 IN 200)
  233*  800M ELAPSED TIME (NON-KEY DECIMAL NUMBER 9(6).999 IN 200)
  234*  800M VELOCITY (NON-KEY DECIMAL NUMBER 9(6).999 IN 200)
  235*  TIME TO IMPACT (NON-KEY DECIMAL NUMBER 9(6).999 IN 200)
  236*  IMPACT RANGE (NON-KEY DECIMAL NUMBER 9(6).999 IN 200)
  237*  IMPACT EL (NON-KEY DECIMAL NUMBER 9(6).999 IN 200)
  238*  IMPACT LAT DEFL (NON-KEY DECIMAL NUMBER 9(6).999 IN 200)
  239*  IMPACT VELOCITY (NON-KEY DECIMAL NUMBER 9(6).999 IN 200)
  216*  FUZE LOT (NAME X(12) IN 200)
  217*  RFLAG (NAME X IN 200)
  240*  R BY R TIME HISTORY-RADAR (RG IN 200)
    241*  ELAPSED TIME (NON-KEY DECIMAL NUMBER 9(6).999 IN 240)
    242*  RANGE (NON-KEY DECIMAL NUMBER 9(6).999 IN 240)
    243*  VELOCITY (NON-KEY DECIMAL NUMBER 9(6).999 IN 240)
    244*  DEFL (NON-KEY DECIMAL NUMBER 9(6).999 IN 240)
    245*  ELEV (NON-KEY DECIMAL NUMBER 9(6).999 IN 240)
```

```
300*  PROP TEST INFO (RG)
  301*  FINAL INHIBITING DATE (DATE IN 300)
  302*  APPROX TEST DATE (DATE IN 300)
  303*  LOT RECOMMENDATION (NAME X(10) IN 300)
  304*  TALIANI LOT VALUE (NON-KEY DECIMAL NUMBER 9(6).999 IN 300)
  306*  MOTOR TUBE LOT (NON-KEY NAME X(12) IN 300)
  307*  IGNITER LOT (NON-KEY NAME X(12) IN 300)
  308*  NOZZLE FIN LOT (NON-KEY NAME X(12) IN 300)
  309*  TALIANI STATUS (NAME X(6) IN 300)
  320*  STATIC TEST INFO-PROPELLANT (RG IN 300)
    321*  EARLY MAXIMUM 165 N (NON-KEY INTEGER NUMBER 999 IN 320)
    322*  EARLY MAXIMUM 165 MEAN (DECIMAL NUMBER 9(6).999 IN 320)
    323*  EARLY MAXIMUM 165 STD (DECIMAL NUMBER 9(6).999 IN 320)
    324*  EARLY MAXIMUM 165 STATUS (NAME X(6) IN 320)
    325*  LATE MAXIMUM 165 N (NON-KEY INTEGER NUMBER 999 IN 320)
    326*  LATE MAXIMUM 165 MEAN (DECIMAL NUMBER 9(6).999 IN 320)
    327*  LATE MAXIMUM 165 STD (DECIMAL NUMBER 9(6).999 IN 320)
    328*  LATE MAXIMUM 165 STATUS (NAME X(6) IN 320)
    329*  FORMULA TIME 130 N (NON-KEY INTEGER NUMBER 9(7) IN 320)
    330*  FORMULA TIME 130 MEAN (DECIMAL NUMBER 9(6).999 IN 320)
    331*  FORMULA TIME 130 STD (DECIMAL NUMBER 9(6).999 IN 320)
    332*  FORMULA TIME 130 STATUS (NAME X(6) IN 320)
    333*  FORMULA TIME MINUS 10 N (NON-KEY INTEGER NUMBER 9(7) IN 320
          )
    334*  FORMULA TIME MINUS 10 MEAN (DECIMAL NUMBER 9(6).999 IN 320)
    335*  FORMULA TIME MINUS 10 STD (DECIMAL NUMBER 9(6).999 IN 320)
    336*  FORMULA TIME MINUS 10 STATUS (NAME X(6) IN 320)
  350*  PROP ATTRIBUTE INFO (RG IN 300)
    351*  PROP SPECIFICATION (NON-KEY NAME X(15) IN 350)
    352*  PERCENT DEFECTIVE CRITICAL (DECIMAL NUMBER 9(6).999 IN 350)
    353*  PERCENT DEFECTIVE MAJOR ASSEMBLY (DECIMAL NUMBER 9(6).999 I
          N 350)
    354*  PERCENT DEFECTIVE MINOR ASSEMBLY (DECIMAL NUMBER 9(6).999 I
          N 350)
    355*  PERCENT DEFECTIVE XRAY (DECIMAL NUMBER 9(6).999 IN 350)
    360*  PROP ATTRIBUTE FAILURE INFO (RG IN 350)
      361*  PROP ATTRIBUTE NAME (NAME X(20) IN 360)
      362*  PROP FAILURES +165 (INTEGER NUMBER 99 IN 360)
      363*  PROP FAILURES +130 (INTEGER NUMBER 99 IN 360)
      364*  PROP FAILURES -10 (INTEGER NUMBER 99 IN 360)
      365*  PROP FAILURES -65 (INTEGER NUMBER 99 IN 360)
      366*  PROP FAILURES TOTAL (INTEGER NUMBER 99 IN 360)
      367*  PROP ATTRIBUTE EVALUATION (NAME X(6) IN 360)
```

```
4001*  AIDS (RG)
  4002*  ZZZZ (NON-KEY TEXT X(20) IN 4001)
 500*  STATIC TEST INFO-MOTOR (RG)
  501*  MOTOR STATIC DISPOSITION (NAME X(6) IN 500)
  520*  MOTOR STATIC TEST (RG IN 500)
    521*  CONDITIONING TEMP (NAME X(6) IN 520)
    523*  MOTOR TEST DATE (DATE IN 520)
    530*  MOTOR R BY R STATIC TEST INFO (RG IN 520)
      531*  MOTOR NUMBER (INTEGER NUMBER 99 IN 530)
      532*  MOTOR RESISTANCE (DECIMAL NUMBER 99.99 IN 530)
      533*  MOTOR EARLY MAXIMUM THRUST (DECIMAL NUMBER 9(6).99 IN 530
            )
      534*  MOTOR LATE MAXIMUM THRUST (DECIMAL NUMBER 9(6).99 IN 530)
      535*  MOTOR IGNITION DELAY (DECIMAL NUMBER 9.999 IN 530)
900*  DATA CARD INFO (RG)
  901*  COMPONENT NAME (NAME X(10) IN 900)
  902*  COMPONENT P NUMBER (NAME X(10) IN 900)
  910*  COMPONENT LOT INFO (RG IN 900)
    911*  COMPONENT LOT (NAME X(12) IN 910)
    912*  COMPONENT QUANTITY (NON-KEY INTEGER NUMBER 9(6) IN 910)
    913*  COMPONENT DATE (NON-KEY DATE IN 910)
 920*  COMMENT INFO (RG)
  921*  COMMENTS (NON-KEY TEXT X(80) IN 920)
600*  BALLISTIC TEST INFO-WARHEAD FUZE (RG)
  601*  WHO TEST PHASE (NAME X(10) IN 600)
  602*  WHO SAMPLES (NON-KEY INTEGER NUMBER 999 IN 600)
  603*  WHO DUDS (INTEGER NUMBER 999 IN 600)
  604*  MOTOR LOT FIRED ON (NAME X(13) IN 600)
  605*  DUD RELATED RADAR DATA (RG IN 600)
    606*  MOTOR ROUND OF DUD (NON-KEY INTEGER NUMBER 999 IN 605)
```

```
4009*  FUZE (STRING (PRINT/NAME,STUB,GROUP,NULL SUPPRESS,REPEAT SUPPRE
       SS/BY ENTRY,C1,C2,C3,C4,C5,C6,C7,C9,C10,C11,C12,C14,C15,C400,C4
       50,C452,C480 WH C3 EQ *1*%*ZZZ1*%))
4010*  FUTUR (STRING (PRINT/NAME,STUB,GROUP,NULL SUPPRESS,REPEAT SUPPR
       ESS/BY ENTRY,C1,C2,C3,C4,C5,C6,C7,C9,C10,C11,C12,C14,C15,C500,C
       520,C560,C562 WH C3 EQ *1*%*ZZZ1*%))
4003*  ZZZ1 (STRING (MESSAGE FILE IS OUTPUT%PRINT/NULL SUPPRESS,STUB S
       UPPRESS/ZZZZ2%))
4004*  ARIES (STRING (MESSAGE FILE IS DUM.%CONTROL%OBN IS ARIES%MESSAG
       E FILE IS OUTPUT% PRINT/NULL SUPPRESS,STUB SUPPRESS/ZZZZ2%))
4005*  DISPLAY (STRING (PRINT/NAME,STUB,GROUP,NULL SUPPRESS,REPEAT SUP
       PRESS/BY ENTRY,C1,C2,C3,C4,C5,C6,C7,C9,C10,C11,C12,C14,C15 WH C
       3 EQ *1*%*ZZZ1*%))
4006*  SUMMARY (STRING (PRINT/NAME,STUB,GROUP,NULL SUPPRESS,REPEAT SUP
       PRESS/BY ENTRY,C1,C2,C3,C4,C5,C6,C7,C9,C10,C11,C12,C14,C15,C100
       WH C3 EQ *1*%*ZZZ1*%))
4007*  COMPLOT (STRING (PRINT/NAME,STUB,GROUP,NULL SUPPRESS,REPEAT SUP
       PRESS/BY ENTRY,C1,C2,C3,C4,C5,C6,C7,C9,C10,C11,C12,C14,C15,C260
       ,C262 WH C3 EQ *1*%*ZZZ1*%))
4008*  PROP (STRING (PRINT/NAME,STUB,GROUP,NULL SUPPRESS,REPEAT SUPPRE
       SS/BY ENTRY,C1,C2,C3,C4,C5,C6,C7,C9,C10,C11,C12,C14,C15,C300,C3
       50,C360 WH C3 EQ *1*%*ZZZ1*%))
3002*  CLEAR RF (STRING (REMOVE C214 WH C214 EXISTS%CLEAR%))
3001*  SET RF (STRING (%IF *1** THEN ADD C214 EQ *2** WHERE *3*%T%CLE
       AR      AUTOMATICALLY%))
2001*  FILE1 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE1
       %              DESCRIBE *1*%PRINT *1* WHERE *2*%))
2002*  FILE2 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE2
       %              DESCRIBE *1*%PRINT *1* WHERE *2*%))
2003*  FILE3 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE3
       %              DESCRIBE *1*%PRINT *1* WHERE *2*%))
2004*  FILE4 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE4
       %              DESCRIBE *1*%PRINT *1* WHERE *2*%))
2005*  FILE5 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE5
       %              DESCRIBE *1*%PRINT *1* WHERE *2*%))
2006*  FILE6 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE6
       %              DESCRIBE *1*%PRINT *1* WHERE *2*%))
2007*  FILE7 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE7
       %              DESCRIBE *1*%PRINT *1* WHERE *2*%))
2008*  FILE8 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE8
       %              DESCRIBE *1*%PRINT *1* WHERE *2*%))
2009*  FILE9 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE9
       %              DESCRIBE *1*%PRINT *1* WHERE *2*%))
2010*  FILE10 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       10%            DESCRIBE *1*%PRINT *1* WHERE *2*%))
2011*  FILE11 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       11%            DESCRIBE *1*%PRINT *1* WHERE *2*%))
2012*  FILE12 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       12%            DESCRIBE *1*%PRINT *1* WHERE *2*%))
2013*  FILE13 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       13%            DESCRIBE *1*%PRINT *1* WHERE *2*%))
2014*  FILE14 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       14%            DESCRIBE *1*%PRINT *1* WHERE *2*%))
2015*  FILE15 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       15%            DESCRIBE *1*%PRINT *1* WHERE *2*%))
2016*  FILE16 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       16%            DESCRIBE *1*%PRINT *1* WHERE *2*%))
2017*  FILE17 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       17%            DESCRIBE *1*%PRINT *1* WHERE *2*%))
2018*  FILE18 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       18%            DESCRIBE *1*%PRINT *1* WHERE *2*%))
2019*  FILE19 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       19%            DESCRIBE *1*%PRINT *1* WHERE *2*%))
2020*  FILE20 (STRING (PRINT/BLOCK,STUB SUPPRESS/% REPORT FILE IS FILE
       20%            DESCRIBE *1*%PRINT *1* WHERE *2*%))
```

EXAMPLE

No. 1

ARTIL DATA BASE

```
          DBN IS ARTIL$
ASSIGNED ARTIL                    50        626      10/22/75  11.16.47.
          *FILE1(C3,C4 EQ M490 AND C112 EQ TEST AND C431 EXISIS)$
          *FILE2(C412,C4 EQ M490 AND C112 EQ TEST)$
          *FILE4(C431,C4 EQ M490 AND C112 EQ TEST)$
          *FILE5(C432,C4 EQ M490 AND C112 EQ TEST)$
          EXIT$
          END SYSTEM 2000
```

```
                    ---- INPUT CARD SUMMARY FOR THIS RUN ----
C
C     INPUT DATA DISTRIBUTION,MEAN AND VARIANCE ANALYSIS USING BASIC
C          IOVER=0 DO NOT PERFORM DATA CHECK
C          IOVER=1 F-TEST(NO OVERRIDE)  2 INPUT GROUPS
C          IOVER=2 BARTLETTS TEST (NO OVERRIDE) 2 OR MORE INPUT GROUPS
C          IOVER=3 T-TEST(NO OVERRIDE) 2 INPUT GROUPS
C          IOVER=4 POOLED MEAN AND VARIANCE(NO OVERRIDE) 2 OR MORE INPUT GROUPS
C          IOVER=5 1-WAY ANOVA(NO OVERRIDE) 2 OR MORE INPUT GROUPS
C
C          TO OVERRIDE FAILSAFE CHECKS ADD 10 TO IOVER
C           EG. IOVER=11 PERFORMS F-TEST WITH OVERRIDE
C
  $BASIC LIST=1,I1=4,I2=5$
  $BASIC I1=4,I2=5,IOVER=1$
  $BASIC I1=4,I2=5,IOVER=11$
C
C     PLOT PE HOR AND PE VERT VERSU     , NUMBER
C
  $SCTPLT IDEP=1,INDI=4,IND2=5,YA     ,YMAX=0.50$
C
C     PLOT HISTOGRAMS OF PE HOR,,, VERT AND PE CORR MEAN
C
  $HIST IDEP=4,NBAR=10,RUP=0.50,RLOW=0.$
  $HIST IDEP=5,NBAR=10,RUP=0.50,RLOW=0.$
  $HIST IDEP=2,NBAR=10,RUP=3900.,RLOW=3000.$
```

--- FILE CONTENT SUMMARY FOR THIS RUN ---

FILE NUMBER	ELEMENT NUMBER	ELEMENT TYPE	ELEMENT NAME
1	3	NAME	LOT
2	412	INTEGER	VEL CORR MEAN-HEP
3	---	EMPTY FILE	---
4	451	DECIMAL	PE HOR
5	452	DECIMAL	PE VERT
6	---	EMPTY FILE	---
7	---	EMPTY FILE	---
8	---	EMPTY FILE	---
9	---	EMPTY FILE	---
10	---	EMPTY FILE	---
11	---	EMPTY FILE	---
12	---	EMPTY FILE	---
13	---	EMPTY FILE	---
14	---	EMPTY FILE	---
15	---	EMPTY FILE	---
16	---	EMPTY FILE	---
17	---	EMPTY FILE	---
18	---	EMPTY FILE	---
19	---	EMPTY FILE	---
20	---	EMPTY FILE	---

```
$BASIC
LIST   = 1.
IOVER  = 0.      VARIANCE-COVARIANCE MATRIX:
11     = 4.
                  .6133E-02    .1344E-02
12     = 5.       .1344E-02    .4164E-02
14     = 0.      CORRELATION MATRIX:
14     = 0.
                  1.000        .2659
15     = 0.       .2659        1.000
16     = 0.      MEANS:
                     .2277        .2050
17     = 0.
                STANDARD DEVIATIONS:
18     = 0.        .0783        .0645
19     = 0.      NUMBER OBSERVATIONS:   50
110    = 0.
$END
```

LISTING OF INPUT DATA

1	2
PE HOR	PE VERT
.260	.110
.150	.290
.090	.210
.170	.170
.160	.220
.190	.190
.280	.120
.250	.140
.250	.270
.210	.250
.160	.120
.250	.180
.260	.210
.220	.240
.210	.130
.220	.220
.180	.210
.320	.290
.410	.220
.230	.200
.170	.210
.250	.140
.220	.180
.250	.230
.250	.210
.120	.120
.250	.230
.220	.370
.190	.170
.190	.160
.280	.170
.360	.220
.170	.260
.120	.120
.190	.260
.140	.200
.140	.260
.240	.150
.160	.120
.350	.310
.400	.260
.280	.110
.310	.170
.370	.130
.150	.160
.220	.170
.200	.220
.440	.270
.440	.430
.280	.210
.220	.180
.270	.280
.170	.230
.220	.180
.150	.160
.130	.130
.100	.270
.180	.310
.150	.290
.310	.180

$BASIC
LIST = 0.
IOVER = 1.
I1 = 4.
I2 = 5.
I3 = 0.
I4 = 0.
I5 = 0.
I6 = 0.
I7 = 0.
I8 = 0.
I9 = 0.
I10 = 0.
$END

VARIANCE-COVARIANCE MATRIX:

.6133E-02 .1344E-02
.1344E-02 .4164E-02

CORRELATION MATRIX:

1.000 .2659
.2659 1.000

MEANS:
.2277 .2050

STANDARD DEVIATIONS:
.0784 .0645

NUMBER OBSERVATIONS: 60

TEST CHI-SQUARED= 24.477 VARIABLE NUMBER 2
SINCE CHI-SQUARED(DF=14)=23.685 AT 5 PERCENT LEVEL OF SIGNIFICANCE,
TEST DIST IS NOT ASSUMED NORMAL AT THIS SIGNIFICANCE LEVEL
IN ABOVE TEST DATA FROM XBAR+-3 SIGMA DIVIDED INTO 17 INTERVALS
TO TEST FOR NORMALITY 17-3 DEGREES OF FREEDOM USED

USER REQUESTED TEST NOT PERFORMED DUE TO NON-NORMAL INPUT DATA...
RERUN WITH IOVER = 11 TO OVERRIDE NORMALITY CHECKS.

CHI-SQUARE DISTRIBUTION

VALUES OF CHI SQUARE AT SPECIFIED LEVELS OF SIGNIFICANCE - SINGLE TAIL

DF	.001	.005	.010	.025	.050	.100
1	10.83	7.88	6.63	5.02	3.84	2.71
2	13.82	10.60	9.21	7.38	5.99	4.61
3	16.27	12.80	11.30	9.35	7.81	6.25
4	18.47	14.90	13.30	11.10	9.49	7.78
5	20.52	16.70	15.10	12.80	11.10	9.24
6	22.46	18.50	16.80	14.40	12.60	10.60
7	24.32	20.30	18.50	16.00	14.10	12.00
8	26.13	22.00	20.10	17.50	15.50	13.40
9	27.88	23.60	21.70	19.00	16.90	14.70
10	29.59	25.20	23.20	20.50	18.30	16.00
11	31.26	26.80	24.70	21.90	19.70	17.30
12	32.91	28.30	26.20	23.30	21.00	18.50
13	34.53	29.80	27.70	24.70	22.40	19.80
14	36.12	31.30	29.10	26.10	23.70	21.10
15	37.70	32.80	30.60	27.50	25.00	22.30
16	39.25	34.30	32.00	28.80	26.30	23.50
17	40.79	35.70	33.40	30.20	27.60	24.80
18	42.31	37.20	34.80	31.50	28.90	26.00
19	43.82	38.60	36.20	32.90	30.10	27.20
20	45.32	40.00	37.60	34.20	31.40	28.40
21	46.80	41.40	38.90	35.50	32.70	29.60
22	48.27	42.80	40.30	36.80	33.90	30.80
23	49.73	44.20	41.60	38.10	35.20	32.00
24	51.18	45.60	43.00	39.40	36.40	33.20
25	52.62	46.90	44.30	40.60	37.70	34.40
26	54.05	48.30	45.60	41.90	38.90	35.60
27	55.48	49.60	47.00	43.20	40.10	36.70
28	56.89	51.00	48.30	44.50	41.30	37.90
29	58.30	52.30	49.60	45.70	42.60	39.10
30	59.70	53.70	50.90	47.00	43.80	40.30

VARIANCE-COVARIANCE MATRIX:

.6133E-02 .1344E-02
.1344E-02 .4164E-02

CORRELATION MATRIX:

1.000 .2659
.2659 1.000

MEANS:

.2277 .2050

STANDARD DEVIATIONS:

.0783 .0645

NUMBER OBSERVATIONS: 60

TEST CHI-SQUARED= 24.477 VARIABLE NUMBER 2
SINCE CHI-SQUARED(DF=14)=23.685 AT 5 PERCENT LEVEL OF SIGNIFICANCE,
TEST DIST IS NOT ASSUMED NORMAL AT THIS SIGNIFICANCE LEVEL
IN ABOVE TEST DATA FROM XBAR+-3 SIGMA DIVIDED INTO 17 INTERVALS
TO TEST FOR NORMALITY 17-3 DEGREES OF FREEDOM USED

CALCULATED VARIANCE F-RATIO FOR ABOVE DATA = 1.473
DEGREES OF FREEDOM FOR NUMERATOR = 59
DEGREES OF FREEDOM FOR DENOMENATOR = 59
IF FCALC IS GREATER THAN F-THEORETICAL , REJECT HYPOTHESIS OF EQUALITY OF VARIANCES...OTHERWISE ACCEPT

SUBSIC

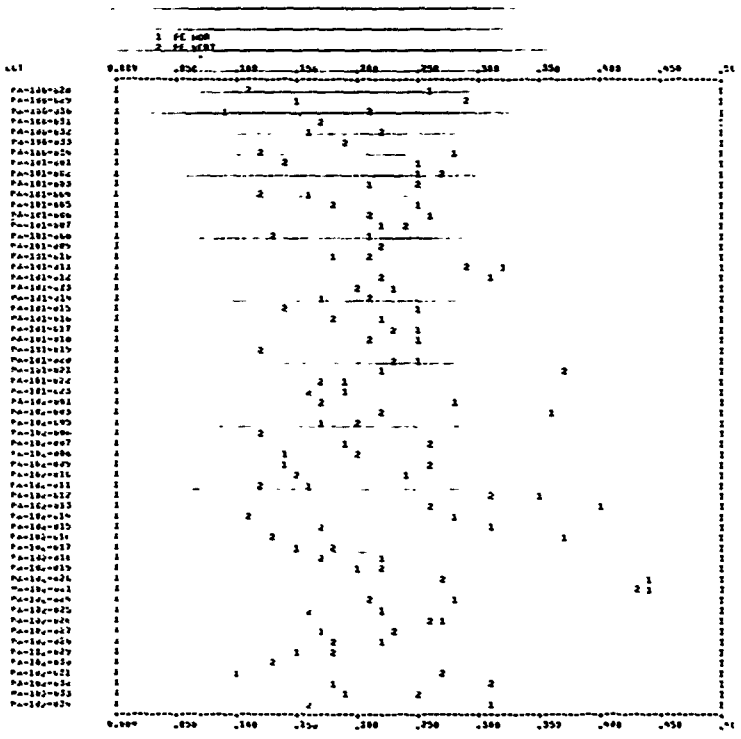
LIST = 0.
LOVER = 11.
11 = 4.
12 = 5.
13 = 0.
14 = 0.
15 = 0.
16 = 0.
17 = 0.
18 = 0.
19 = 0.
110 = 0.

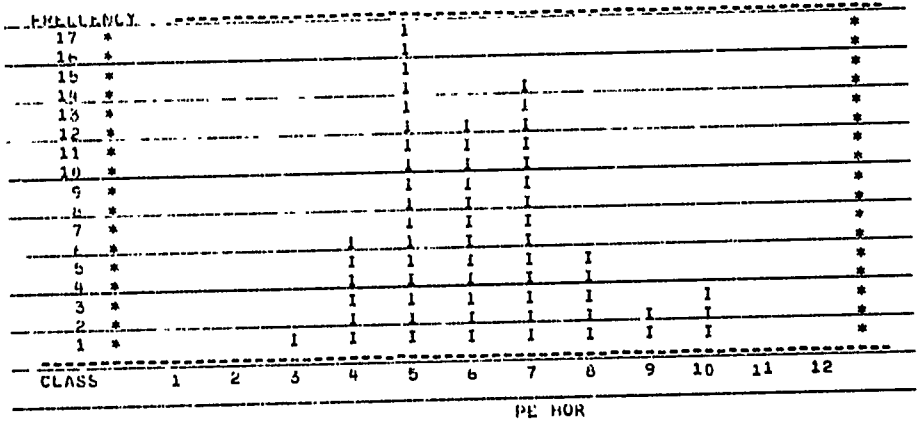
SEND

LISTING OF INPUT DATA

NUM	LOT	PE HOR	PE VERT
1	MA-100-028	.260	.110
2	MA-100-029	.150	.290
3	MA-100-030	.090	.210
4	MA-100-031	.170	.170
5	MA-100-032	.160	.220
6	MA-100-033	.190	.190
7	MA-100-034	.280	.120
8	MA-101-001	.250	.140
9	MA-101-002	.250	.270
10	MA-101-003	.210	.250
11	MA-101-004	.160	.120
12	MA-101-005	.250	.180
13	MA-101-006	.260	.210
14	MA-101-007	.220	.240
15	MA-101-008	.210	.130
16	MA-101-009	.220	.220
17	MA-101-010	.160	.210
18	MA-101-011	.320	.290
19	MA-101-012	.310	.220
20	MA-101-013	.230	.200
21	MA-101-014	.170	.210
22	MA-101-015	.250	.140
23	MA-101-016	.220	.180
24	MA-101-017	.250	.230
25	MA-101-018	.250	.210
26	MA-101-019	.120	.120
27	MA-101-020	.250	.230
28	MA-101-021	.220	.370
29	MA-101-022	.190	.170
30	MA-101-023	.190	.160
31	MA-102-001	.260	.170
32	MA-102-003	.360	.220
33	MA-102-005	.170	.200
34	MA-102-006	.120	.120
35	MA-102-007	.190	.260
36	MA-102-008	.140	.200
37	MA-102-009	.140	.260
38	MA-102-010	.240	.150
39	MA-102-011	.160	.120
40	MA-102-012	.350	.310
41	MA-102-013	.400	.260
42	MA-102-014	.260	.110
43	MA-102-015	.310	.170
44	MA-102-016	.370	.130
45	MA-102-017	.150	.180
46	MA-102-018	.220	.170
47	MA-102-019	.200	.220
48	MA-102-020	.440	.270
49	MA-102-021	.440	.430
50	MA-102-024	.260	.210
51	MA-102-025	.220	.160
52	MA-102-026	.270	.260
53	MA-102-027	.170	.230
54	MA-102-028	.220	.180
55	MA-102-029	.150	.180
56	MA-102-030	.140	.130
57	MA-102-031	.100	.270
58	MA-102-032	.160	.310
59	MA-102-033	.190	.250
60	MA-102-034	.310	.160

$LOTPLT
IDLP = 1,
IND1 = 4,
IND2 = 5,
IND3 = 0,
YMIN = 0.0,
YMAX = 0.55E+00,
YMAN1 = -0.995E+02,
YMAN2 = -0.995E+02,
$END


1 PC HOR
2 PC VERT



HISTOGRAM SUMMARY

INTERVAL	LOWER BOUND	UPPER BOUND	FREQUENCY	PERCENT	CUMULATIVE FREQ	CUMULATIVE PERCENT
1	**********	.001	0	0.00	0	0.00
2	0.000	.049	0	0.00	0	0.00
3	.050	.099	1	1.67	1	1.67
4	.100	.149	6	10.00	7	11.67
5	.150	.199	17	28.33	24	40.00
6	.200	.249	12	20.00	36	60.00
7	.250	.299	14	23.33	50	83.33
8	.300	.349	5	8.33	55	91.67
9	.350	.399	2	3.33	57	95.00
10	.400	.449	3	5.00	60	100.00
11	.450	.499	0	0.00	60	100.00
12	.500	**********	0	0.00	60	100.00

PE HOR

$HIST

IDLP = 5.

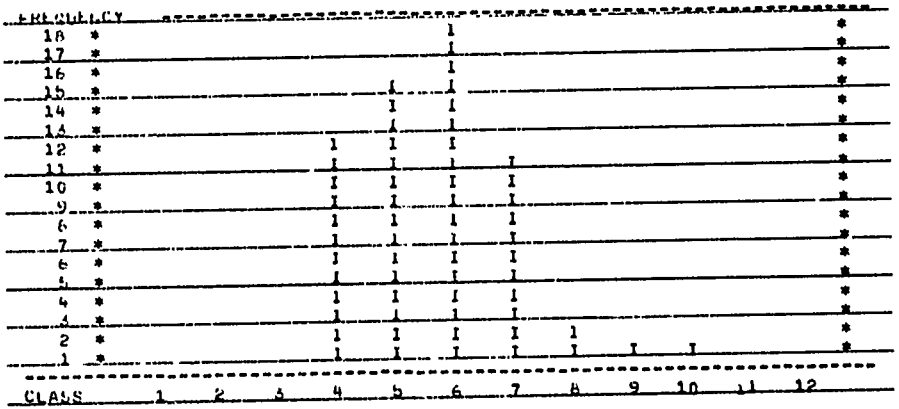
NBAR = 10.

NSP = 4.

KUP = 0.5E+00.

KLOK = 0.0.

$END



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HISTOGRAM SUMMARY

INTERVAL	LOWER BOUND	UPPER BOUND	FREQUENCY	PERCENT	CUMULATIVE FREQ	CUMULATIVE PERCENT
1	**********	-.001	0	0.00	0	0.00
2	0.000	.049	0	0.00	0	0.00
3	.050	.099	0	0.00	0	0.00
4	.100	.149	12	20.00	12	20.00
5	.150	.199	15	25.00	27	45.00
6	.200	.249	18	30.00	45	75.00
7	.250	.299	11	18.33	56	93.33
8	.300	.349	2	3.33	58	96.67
9	.350	.399	1	1.67	59	98.33
10	.400	.449	1	1.67	60	100.00
11	.450	.499	0	0.00	60	100.00
12	.500	**********	0	0.00	60	100.00

PE VERT

SHIST

IULP = 2.

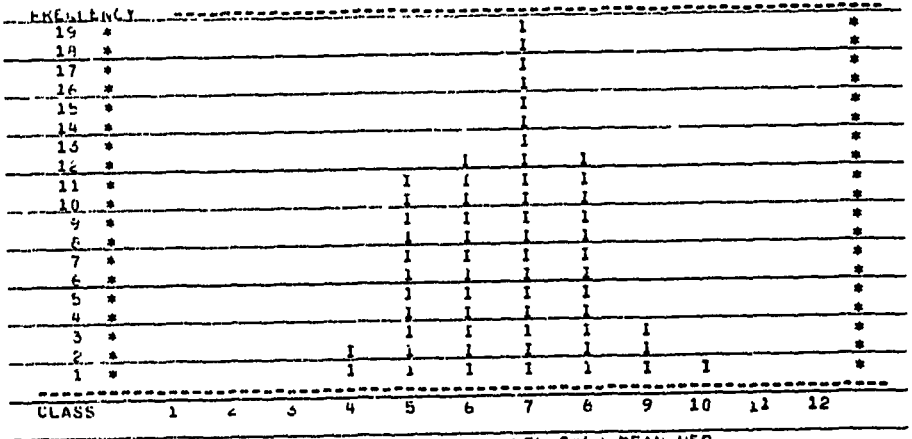
NHAR = 100.

NSP = 4.

RUP = 0.49E+04.

RLO = 0.38E+04.

SEAC



HISTOGRAM SUMMARY

INTERVAL	LOWER BOUND	UPPER BOUND	FREQUENCY	PERCENT	CUMULATIVE FREQ	CUMULATIVE PERCENT
1	**********	3799.999	0	0.00	0	0.00
2	3800.000	3809.999	0	0.00	0	0.00
3	3810.000	3819.999	0	0.00	0	0.00
4	3820.000	3829.999	2	3.33	2	3.33
5	3830.000	3839.999	11	18.33	13	21.67
6	3840.000	3849.999	12	20.00	25	41.67
7	3850.000	3859.999	19	31.67	44	73.33
8	3860.000	3869.999	12	20.00	56	93.33
9	3870.000	3879.999	3	5.00	59	98.33
10	3880.000	3889.999	1	1.67	60	100.00
11	3890.000	3899.999	0	0.00	60	100.00
12	3900.000	**********	0	0.00	60	100.00

VEL CORR MEAN-HEP

EXAMPLE

No. 2

LAW DATA BASE

```
          LUN IS LAW%
     ASSIGNED LAW

  *FILE1(LOT, CALIBER EQ 66 MM AND INITIAL DISP EQ A AND PHASE EQ ACC+70)%
  *FILE2(TEST DATE,CALIBER EQ 66 MM AND INITIAL DISP EQ A)%
  *FILE3(QUANTITY ,CALIBER EQ 66 MM AND INITIAL DISP EQ A)%
  *FILE4(LOT      ,CALIBER EQ 66 MM AND INITIAL DISP EQ A)%
  *FILE5(VEL MEAN ,CALIBER EQ 66 MM AND INITIAL DISP EQ A AND PHASE EQ ACC+70)%
  *FILE6(C136     ,CALIBER EQ 66 MM AND INITIAL DISP EQ A AND PHASE EQ ACC+70)%
  *FILE7(C137     ,CALIBER EQ 66 MM AND INITIAL DISP EQ A AND PHASE EQ ACC+70)%
  *FILE8(C112     ,CALIBER EQ 66 MM AND INITIAL DISP EQ A AND PHASE EQ ACC+70)%
  *FILE9(VEL MEAN ,CALIBER EQ 66 MM AND INITIAL DISP EQ A AND PHASE EQ ACC+140)%
  *FILE10(VEL MEAN,CALIBER EQ 66 MM AND INITIAL DISP EQ A AND PHASE EQ ACC-40)%
  *FILE11(VEL MEAN,CALIBER EQ 66 MM AND INITIAL DISP EQ A AND PHASE EQ DROP+70)%
  *FILE12(VEL MEAN,CALIBER EQ 66 MM AND INITIAL DISP EQ A AND PHASE EQ W-PEN)%
  EXIT%
  END SYSTEM 2006
```

--- INPUT CARD SUMMARY FOR THIS RUN ---

```
C
C     SAMPLE ARIES INPUT DECK STRUCTURE
C
 $COMMENT HERE IS A SAMPLE OF THE ARIES SYSTEM IN ACTION FOR LUN IS LAW
 $OUTPUT LIST=1$
 $BASIC LIST=1,I1=9,I2=10,I3=11,I4=12$
 $BASIC LIST=1,I1=5,I2=6,I3=7$
 $PLOT IDEP=6,IND1=5$
 $PLOT IDEP=7,IND1=5$
 $AREG IDEP=5, IND1=6, IND2=7$
 $SREG IDEP=5, IND1=6,IND2=7,IRAN1=1, INES=1, LIST=1$
 $TIME IDEP=5,IND1=2,IND2=4$
 $TIME IDEP=5,IND1=2,IND2=4,YMIN=0.,YMAX=1000.$
 $TIME  IDEP=5,IND1=2,IND2=4,YBAR1=475.,YBAR2=525.,YMIN=400.,YMAX=600.$
 $LOTPLT IDEP=1,IND1=6,IND2=7$
 $HIST IDEP=5$
 $TABLE ITABLE=1$
```

--- FILE CONTENT SUMMARY FOR THIS RUN ---

FILE NUMBER	ELEMENT NUMBER	ELEMENT TYPE	ELEMENT NAME
1	3	NAME	LOT
2	10	DATE	TEST DATE
3	5	INTEGER	QUANTITY
4	3	NAME	LOT
5	122	DECIMAL	VEL MEAN
6	136	DECIMAL	MAX HORZ DISPLACEMENT
7	137	DECIMAL	MAX VERT DISPLACEMENT
8	112	INTEGER	AMBIENT TEMP
9	122	DECIMAL	VEL MEAN
10	122	DECIMAL	VEL MEAN
11	122	DECIMAL	VEL MEAN
12	122	DECIMAL	VEL MEAN
13	---	EMPTY FILE	---
14	---	EMPTY FILE	---
15	---	EMPTY FILE	---
16	---	EMPTY FILE	---
17	---	EMPTY FILE	---
18	---	EMPTY FILE	---
19	---	EMPTY FILE	---
20	---	EMPTY FILE	---

```
$OUTPUT
LIST    =  1.
$END
```

LISTING OF INPUT DATA

1	2	3	4	5	6	7	8	9	10
[illegible]	VEL PEAK	MAX HORZ D ISPLACEMEN	MAX VERT D ISPLACEMEN	AMBIENT TE MP	[illegible]	VEL PEAK	VEL PEAK	VEL PEAK	
[illegible]	[illegible]	-21.040	46.102	**********	490.232	429.250	479.500	473.786	
[illegible]	[illegible]	-10.366	20.560	**********	495.009	429.667	476.500	468.190	
[illegible]	[illegible]	14.355	34.027	**********	456.010	434.380	460.500	466.250	
[illegible]	[illegible]	21.396	48.931	**********	490.200	432.900	478.783	460.650	
[illegible]	[illegible]	-11.191	44.027	**********	497.900	434.333	479.690	468.000	
[illegible]	[illegible]	16.716	48.031	**********	490.100	433.800	481.500	479.500	
[illegible]	[illegible]	-15.165	63.210	**********	509.000	434.483	479.000	478.900	
[illegible]	[illegible]	-19.117	43.002	**********	499.000	434.000	488.200	482.480	
[illegible]	[illegible]	30.470	54.346	**********	495.000	433.500	479.100	483.166	
[illegible]	[illegible]	21.757	43.107	**********	490.300	433.300	477.050	477.500	
[illegible]	[illegible]	-29.296	46.252	**********	499.300	431.300	483.500	476.500	
[illegible]	[illegible]	46.794	50.493	**********	508.420	435.100	464.950	478.770	
[illegible]	[illegible]	32.630	44.520	**********	501.220	435.080	479.086	479.880	
[illegible]	[illegible]	-12.696	34.579	**********	499.010	436.100	483.985	**********	
[illegible]	[illegible]	26.369	44.540	**********	496.100	434.900	479.080	**********	
[illegible]	[illegible]	24.476	50.035	**********	490.300	440.300	489.108	**********	
[illegible]	[illegible]	24.050	61.059	**********	499.100	442.080	483.644	**********	
[illegible]	[illegible]	23.563	53.292	**********	490.200	457.600	482.647	**********	
[illegible]	[illegible]	10.495	57.069	**********	490.900	441.995	464.022	**********	
[illegible]	[illegible]	[illegible]	49.130	**********	495.100	434.780	483.080	**********	
[illegible]	[illegible]	36.465	-2.989	**********	499.600	425.380	481.706	**********	
[illegible]	[illegible]	-14.364	65.285	**********	497.700	441.700	470.070	**********	
[illegible]	[illegible]	37.089	48.060	**********	496.450	447.600	468.750	**********	
[illegible]	[illegible]	-23.793	46.277	**********	498.700	439.180	482.068	**********	
[illegible]	[illegible]	32.135	46.596	**********	490.603	443.280	481.086	**********	
[illegible]	[illegible]	-36.043	35.060	**********	496.000	435.125	482.080	**********	
[illegible]	[illegible]	31.431	37.435	**********	497.020	434.205	479.333	**********	
[illegible]	[illegible]	35.960	35.396	**********	496.909	436.000	482.926	**********	
[illegible]	[illegible]	25.483	-44.603	**********	490.326	435.000	470.346	**********	
[illegible]	[illegible]	31.448	30.457	**********	496.000	485.280	479.900	**********	
[illegible]	[illegible]	-16.062	41.292	**********	496.150	432.500	479.286	**********	
[illegible]	[illegible]	-20.696	45.180	**********	457.300	436.000	470.396	**********	
[illegible]	[illegible]	20.427	-15.260	**********	495.400	424.890	460.944	**********	
[illegible]	[illegible]	27.091	-25.461	**********	495.009	437.200	483.609	**********	
[illegible]	[illegible]	-33.435	-22.985	**********	494.000	437.950	481.566	**********	
[illegible]	[illegible]	-20.150	26.227	**********	**********	**********	**********	**********	
[illegible]	[illegible]	-32.031	24.097	**********	**********	**********	**********	**********	
[illegible]	[illegible]	25.983	33.072	**********	**********	**********	**********	**********	
[illegible]	[illegible]	19.392	37.656	**********	**********	**********	**********	**********	
[illegible]	[illegible]	21.495	32.993	**********	**********	**********	**********	**********	
[illegible]	[illegible]	10.370	41.656	**********	**********	**********	**********	**********	
[illegible]	[illegible]	-28.695	37.993	**********	**********	**********	**********	**********	
[illegible]	[illegible]	20.665	38.900	**********	**********	**********	**********	**********	
[illegible]	[illegible]	21.977	41.609	**********	**********	**********	**********	**********	

--- CAUTION...UNEQUAL NUMBER OF OBSERVATIONS IN ANALYSIS FILES ---

FILE NO.	[illegible] OBS
3	44
[illegible]	44
6	44
7	44
[illegible]	8
[illegible]	32
9	22
11	22
[illegible]	42

```
$BASIC
LIST    =  1.
I1      =  9.
I2      =  10.
I3      =  11.
I4      =  12.
I5      =  0.
I6      =  0.
I7      =  0.
I8      =  0.
I9      =  0.
I10     =  0.
$END
```

LISTING OF INPUT DATA

1	2	3	4	5	6
VEL MEAN	VEL MEAN	VEL MEAN	VEL MEAN		
498.222	429.200	479.500	473.700		
495.889	429.667	476.100	480.100		
496.800	434.300	480.500	484.300		
496.200	432.400	478.700	480.600		
497.900	434.333	479.000	480.800		
498.100	433.200	481.500	479.500		
500.800	434.400	479.800	478.900		
499.800	434.600	480.200	482.600		
495.800	435.500	479.100	481.100		
498.300	433.300	477.800	477.500		
499.300	431.300	483.500	478.500		
500.400	435.100	484.400	478.776		
501.333	435.800	479.000	479.000		
499.800	436.100	483.500	**********		
498.100	434.500	479.800	**********		
498.300	440.300	484.100	**********		
499.100	442.600	483.600	**********		
498.200	447.600	482.667	**********		
498.900	441.545	484.800	**********		
495.100	434.700	483.800	**********		
494.600	435.500	481.700	**********		
497.700	441.700	479.800	**********		
496.400	437.600	480.700	**********		
498.700	439.100	482.800	**********		
498.600	443.200	481.000	**********		
496.000	435.125	482.000	**********		
497.000	434.200	479.333	**********		
496.400	436.800	481.900	**********		
498.556	435.600	478.500	**********		
496.800	435.200	479.000	**********		
496.100	432.500	479.200	**********		
497.300	436.800	478.500	**********		
495.400	434.000	480.444	**********		
495.889	437.200	483.600	**********		
494.800	437.900	481.000	**********		

--- CAUTION...UNEQUAL NUMBER OF OBSERVATIONS IN ANALYSIS FILES ---

FILE NO.	NUMBER OBS
9	35
10	35
11	35
12	13

NUMBER OF OBSERVATIONS			
35	35	35	15
MEAN VALUES			
497.617	436.031	460.858	479.644
STANDARD DEVIATION			
1.7352	3.8775	2.2060	2.5490

```
$BASIC
LIST    =  1,
I1      =  5,
I2      =  6,
I3      =  7,
I4      =  0,
I5      =  0,
I6      =  0,
I7      =  0,
I8      =  0,
I9      =  0,
I10     =  0,
$END
```

LISTING OF INPUT DATA

1	2	3	4	5	6
VEL PEAK	MAX HORZ D ISPLACEMEN	MAX VERT D ISPLACEMEN			
480.375	-21.626	46.182			
476.875	-18.366	28.560			
480.500	14.755	38.027			
481.250	21.396	40.931			
482.250	-11.191	44.827			
481.000	16.716	48.031			
478.125	-15.100	63.216			
480.000	-19.117	43.882			
477.500	38.470	54.348			
479.500	21.757	43.167			
481.500	-29.296	46.292			
482.750	46.794	50.443			
485.500	32.638	44.428			
482.143	-12.694	34.579			
480.667	26.569	44.920			
485.833	24.476	58.815			
484.875	24.056	61.059			
482.833	25.569	53.291			
482.714	16.595	57.009			
480.625	20.401	44.158			
476.571	38.405	47.989			
485.857	-12.364	65.265			
484.250	37.009	46.868			
481.000	-25.795	46.277			
483.625	32.135	56.558			
481.000	-30.841	33.668			
480.167	21.251	57.233			
480.875	35.960	35.596			
479.375	25.280	-44.601			
480.375	31.446	30.457			
479.500	-16.864	41.292			
477.875	-28.696	45.100			
480.143	20.627	-15.268			
478.250	27.661	-25.461			
480.429	-33.235	-22.905			
482.026	-20.100	26.227			
485.456	-32.631	24.047			
485.391	25.065	33.672			
488.225	19.392	37.056			
487.641	21.245	32.963			
491.410	16.376	41.656			
489.625	-20.045	57.493			
488.775	20.605	30.984			
490.275	21.977	41.069			

VARIANCE-COVARIANCE MATRIX:

13.83	12.16	16.65
12.16	626.1	34.08
16.65	34.08	524.2

CORRELATION MATRIX:

1.000	.1307	.1956
.1307	1.000	.5948E-01
.1956	.5948E-01	1.000

MEANS:

482.1802	8.5521	37.0878

STANDARD DEVIATIONS:

3.7186	25.0226	22.8957

NUMBER OBSERVATIONS: 44

$PLOT

IDLP = 6.

IND1 = 5.

IND2 = 0.

IND3 = 0.

IND4 = 0.

IND5 = 0.

LENX = 120.

LENY = 120.

XMIN = -0.99E+02.

XMAX = -0.99E+02.

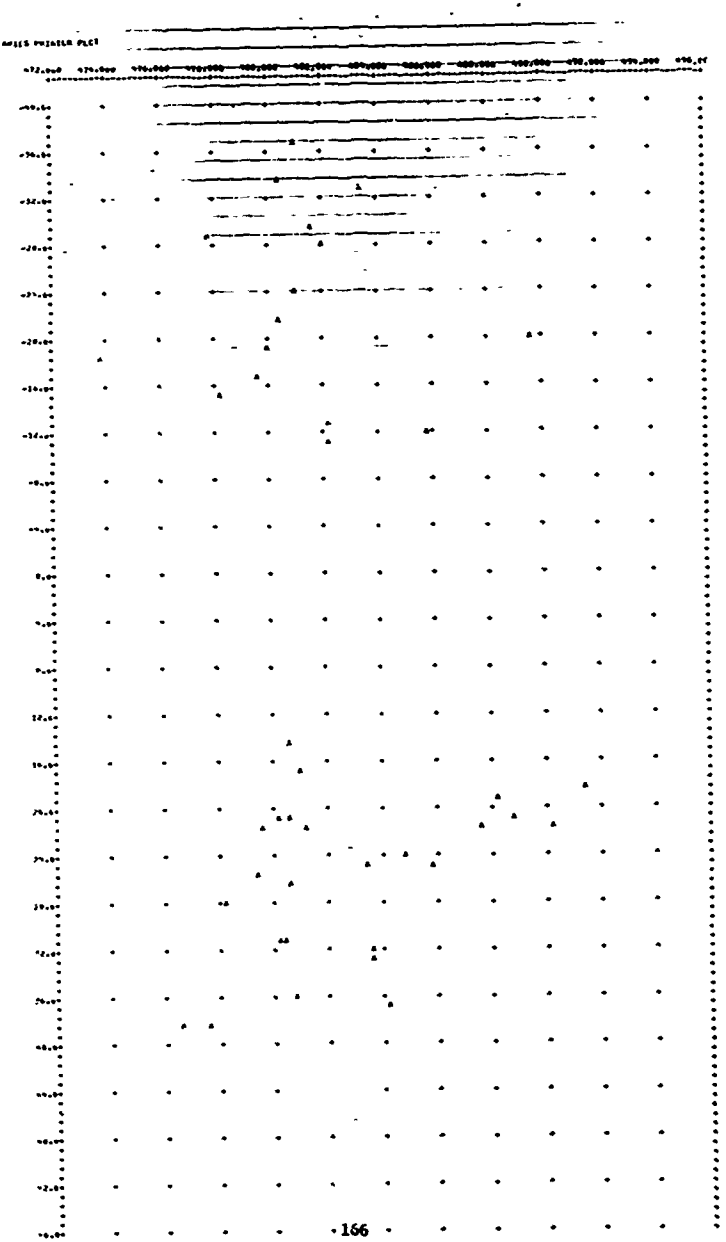
YMIN1 = -0.99E+02.

YMIN2 = -0.99E+02.

```
 YMIN3   = -0.99E+02,
 YMIN4   = -0.99E+02,
 YMIN5   = -0.99E+02,
 YMAX1   = -0.99E+02,
 YMAX2   = -0.99E+02,
 YMAX3   = -0.99E+02,
 YMAX4   = -0.99E+02,
 YMAX5   = -0.99E+02,
 $END
```

DESCRIPTION OF PLOT VARIABLES

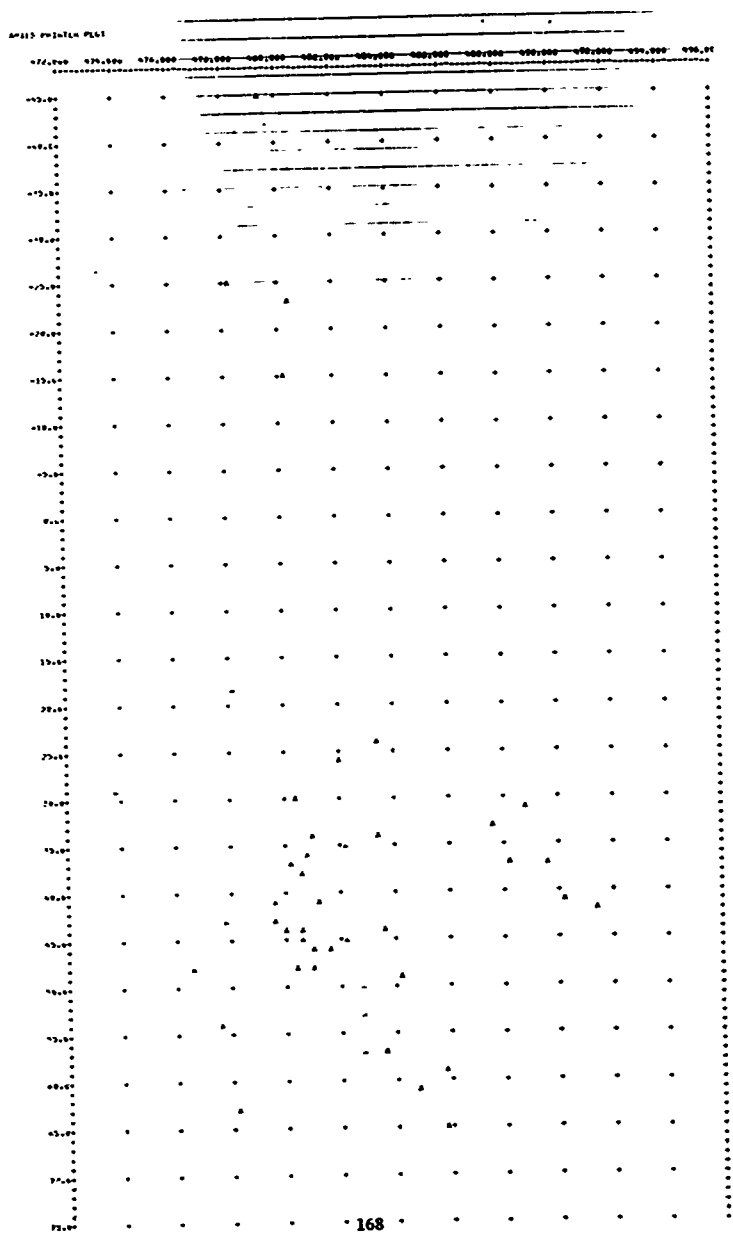
X	MAX HORZ DISPLACEMEN
A	VEL MEAN



```
$PLOT
IDEP    =  7.
IND1    =  5.
IND2    =  0.
IND3    =  0.
IND4    =  0.
IND5    =  5.
LENX    =  120.
LENY    =  120.
XMIN    = -0.99E+02.
XMAX    = -0.99E+02.
YMIN1   = -0.99E+02.
YMIN2   = -0.99E+02.
YMIN3   = -0.99E+02.
YMIN4   = -0.99E+02.
YMIN5   = -0.99E+02.
YMAX1   = -0.99E+02.
YMAX2   = -0.99E+02.
YMAX3   = -0.99E+02.
YMAX4   = -0.99E+02.
YMAX5   = -0.99E+02.
$END
```

DESCRIPTION OF PLOT VARIABLES

X	MAX VERT DISPLACEMEN
A	VEL MEAN



```
$MREG
LIST   =  0.
IDEP   =  5.
IND1   =  6.
ITRAN1 =  0.
RTRAN1 =  0.0.
IND2   =  7.
ITRAN2 =  0.
RTRAN2 =  0.0.
IND3   =  0.
ITRAN3 =  0.
RTRAN3 =  0.0.
IND4   =  0.
ITRAN4 =  0.
RTRAN4 =  0.0.
IND5   =  0.
ITRAN5 =  0.
RTRAN5 =  0.0.
IRES   =  0.
IPLT   =  0.
$END
```

VARIANCE-COVARIANCE MATRIX:

626.1	34.08	12.16
34.08	524.2	16.65
12.16	16.65	13.83

CORRELATION MATRIX:

1.000	.5948E-01	.1307
.5948E-01	1.000	.1956
.1307	.1956	1.000

MEANS:

8.5521	37.0678	482.1802

STANDARD DEVIATIONS:

25.022	22.8957	3.7168

NUMBER OBSERVATIONS: 44

```
ARIES MULTIPLE REGRESSION ANALYSIS

NUMBER IND VARIABLES= 2      ,NUMBER OBS=   44
DETERMINANT OF CORRELATION MATRIX=     .99646
MULTIPLE R=  .229      ,MULTIPLE RSQ=  .052
F RATIO FOR ANOVA ON R=      1.135
DF1=   2      ,DF2=  41

IND VAR NO.       B        BSQ       RXY      B*RXY     RXY/R
    1           .1195     .0143     .1307     .0156     .5704
    2           .1865     .0355     .1956     .0369     .8538

IND VAR NO.       MEAN          STD DEV      RAW WEIGHT
    1              8.5521         25.0226          .01776
    2             37.0878         22.8957          .03062
CONSTANT=     480.8929

IDEP = CONSTANT + RW1XIND1 + RW2XIND2 + ...

DEPENDENT VARIABLE-IDEP ON FILE 5      VEL MEAN
INDEPENDENT VARIABLE-IND1 ON FILE 6      MAX HORZ DISPLACEMEN
INDEPENDENT VARIABLE-IND2 ON FILE 7      MAX-VERT DISPLACEMEN
```

```
$SREG

LIST    =  1,

IDEP    =  5,

IND1    =  6,

ITRAN1  =  13,

RTRAN1  =  0.0,

IND2    =  7,

ITRAN2  =  0,

RTRAN2  =  0.0,
```

```
IND3    =  0.
ITRAN3  =  0.
RTRAN3  =  0.0.
IND4    =  0.
ITRAN4  =  0.
RTRAN4  =  0.0.
IND5    =  0.
ITRAN5  =  0.
RTRAN5  =  0.0.
ELEV    =  0.1E-04.
IRES    =  1.
IPLT    =  0.
SEND
```

VARIANCE-COVARIANCE MATRIX:

13.83	-315.1	16.65
-315.1	.1953E+06	-407.9
16.65	-407.9	524.2

CORRELATION MATRIX:

1.000	-.1917	.1956
-.1917	1.000	-.4031E-01
.1956	-.4031E-01	1.000

MEANS:

482.1802	685.0388	37.0878

STANDARD DEVIATIONS:

3.7186	441.9469	22.8957

NUMBER OBSERVATIONS: 44

LISTING OF INPUT DATA

1	2	3	4	5	6
VEL MEAN	MAX HORZ D ISPLACEMEN	MAX VERT D ISPLACEMEN			
480.375	476.462	48.182			
473.875	337.310	28.560			
480.500	217.710	38.027			
481.250	457.783	40.931			
482.250	125.238	44.827			
481.000	279.425	48.051			
478.125	228.015	65.218			
480.000	365.466	43.862			
477.500	1479.541	54.348			
479.500	473.367	43.167			
481.500	856.256	46.292			
482.750	2189.678	50.443			
485.500	1065.259	44.428			
482.143	161.138	34.579			
480.667	705.912	44.920			
485.833	599.075	58.815			
484.875	578.787	61.059			
482.833	555.498	53.291			
482.714	545.774	57.005			
480.625	416.201	44.138			
476.571	1474.944	47.989			
485.857	153.363	65.285			
484.250	1369.666	48.868			
481.000	566.107	46.277			
483.625	1032.658	56.598			
481.000	1557.259	55.868			
480.167	576.625	37.233			
480.875	1295.122	55.596			
479.375	637.678	-44.601			
480.375	956.977	30.457			
479.500	284.327	41.292			
477.875	634.579	43.100			
480.143	425.473	-15.266			
478.250	766.256	-25.461			
480.429	1104.565	-22.985			
482.026	769.617	26.227			
483.450	1064.782	24.047			
483.395	629.157	33.672			
488.225	376.050	37.056			
487.641	451.350	32.963			
491.[illegible]	337.751	41.656			
489.[illegible]	401.802	37.493			
488.[illegible]	424.566	30.984			
490.275	462.989	41.059			

```
ARIES STEPWISE REGRESSION ANALYSIS
NUMBER IND VARIABLES= 2 .NUMBER OBS=  44 .F-LEVEL=  .000010
MEAN VALUES
   482.18020   665.03677    37.06777
STANDARD DEVIATIONS
     5.71881   441.94694    22.89571
STANDARD ERROR OF Y=      5.71881
STEP NUMBER  1
     VARIABLE ENTERING  2
     F-VALUE CALCULATED     1.6706
     DEGREES OF FREEDOM    42
     STANDARD ERROR OF Y      5.69014
     REG CONSTANT=   461.00193
     COEFFICIENT OF X( 2)=       .03177 .STANDARD ERROR=       ..2458
     PERCENT VARIATION EXPLAINED=   3.83


STEP NUMBER  2
     VARIABLE ENTERING  1
     F-VALUE CALCULATED     1.4960
     DEGREES OF FREEDOM    41
     STANDARD ERROR OF Y      5.66854
     REG CONSTANT=   482.10815
     COEFFICIENT OF X( 1)=      -.00155 .STANDARD ERROR=       ..0127
     COEFFICIENT OF X( 2)=       .03056 .STANDARD ERROR=       ..2445
     PERCENT VARIATION EXPLAINED=   7.21


STEPWISE REGRESSION FINISHED

IDEP = CONSTANT + R*IND1 + R*2IND2 + ...

DEPENDENT VARIABLE-IDEP ON FILE 5      VEL MEAN
INDEPENDENT VARIABLE-IND1 ON FILE 6      MAX HORZ DISPLACEMEn
INDEPENDENT VARIABLE-IND2 ON FILE 7      MAX VERT DISPLACEMEn
```

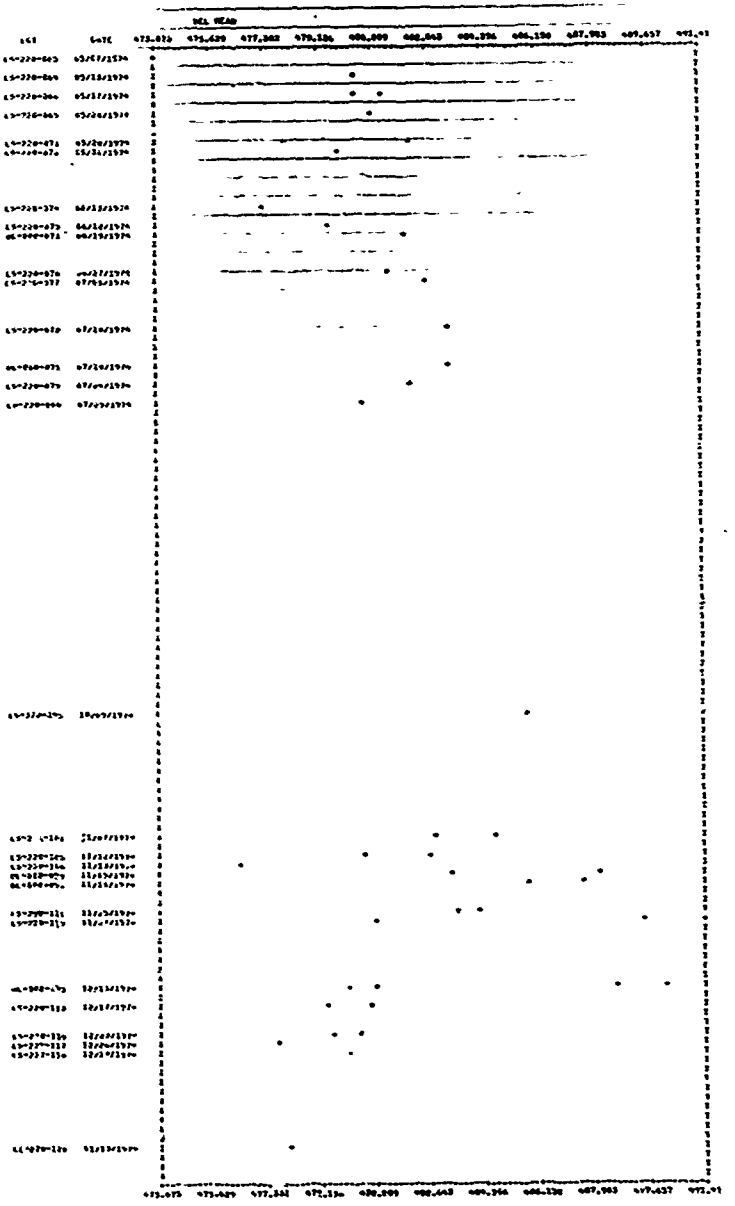
ACTUAL VS. PREDICTED RESULTS

RUN NO.	ACTUAL	PREDICTED	DEVIATION	PERCENT	X(1)	X(2)
1	480.375	482.842	2.467	.51	476.4[illegible]	48.162
2	473.675	482.458	8.583	1.78	337.[illegible]	28.560
3	480.500	482.935	2.435	.50	217.[illegible]	38.027
4	481.250	482.650	1.400	.29	457.[illegible]	40.951
5	482.250	483.284	1.034	.21	125.[illegible]	44.827
6	481.000	483.143	2.143	.44	279.[illegible]	48.041
7	478.125	483.687	5.562	1.15	228.[illegible]	62.218
8	480.000	482.883	2.883	.60	365.[illegible]	42.862
9	477.500	481.476	3.976	.83	1475.[illegible]	54.346
10	479.500	482.694	3.194	.66	472.[illegible]	42.167
11	481.500	482.193	.693	.14	858.[illegible]	46.292
12	482.750	480.257	-2.493	-.52	2185.[illegible]	50.443
13	483.500	481.815	-1.685	-.35	1065.[illegible]	44.428
14	482.143	482.915	.772	.16	161.[illegible]	34.579
15	480.667	482.387	1.720	.36	705.[illegible]	44.920
16	485.833	482.977	-2.856	-.59	599.[illegible]	58.815
17	484.675	483.078	-1.797	-.37	578.[illegible]	61.059
18	482.833	482.876	.043	.01	555.[illegible]	52.291
19	482.714	483.315	.601	.12	345.[illegible]	57.009
20	480.625	482.812	2.187	.45	416.[illegible]	44.158
21	476.571	481.289	4.718	.98	1474.[illegible]	47.969
22	485.857	483.866	-1.991	-.41	153.[illegible]	68.285
23	484.250	481.479	-2.771	-.58	1369.[illegible]	48.868
24	481.000	482.645	1.645	.34	566.[illegible]	46.277
25	483.625	482.238	-1.387	-.29	1032.[illegible]	56.598
26	491.000	481.040	.040	.01	1357.[illegible]	32.868
27	480.167	481.733	1.566	.33	976.[illegible]	37.233
28	480.875	481.192	.317	.07	1293.[illegible]	35.596
29	479.375	479.755	.380	.08	635.[illegible]	-44.601
30	480.375	481.507	1.132	.24	988.[illegible]	30.457
31	479.500	482.930	3.430	.71	284.[illegible]	41.292
32	477.875	482.132	4.257	.88	834.[illegible]	42.100
33	480.143	480.982	.839	.17	425.[illegible]	-15.268
34	478.250	480.142	1.892	.39	766.[illegible]	-25.461
35	480.429	479.696	-.733	-.15	1104.[illegible]	-22.905
36	482.026	481.686	-.340	-.07	785.[illegible]	26.227
37	483.450	481.193	-2.257	-.47	1064.[illegible]	24.047
38	483.395	482.169	-1.226	-.25	629.[illegible]	32.872
39	488.225	482.658	-5.567	-1.15	376.[illegible]	37.056
40	487.641	482.417	-5.224	-1.08	491.[illegible]	32.983
41	491.410	482.858	-8.552	-1.77	337.[illegible]	41.656
42	489.625	482.631	-6.994	-1.45	401.[illegible]	37.493
43	488.775	482.397	-6.378	-1.32	429.[illegible]	30.984
44	490.275	482.616	-7.659	-1.59	482.[illegible]	41.069

```
$TIME
 IDEP    =  5.
 IND1    =  2.
 IND2    =  4.
 XMIN    = -0.99E+02.
 XMAX    = -0.99E+02.
 YMIN    = -0.99E+02.
 YMAX    = -0.99E+02.
 YBAR1   = -0.99E+02.
 YBAR2   = -0.99E+02.
 $END
```

LISTING OF INPUT DATA

NUM	LOT	DATE	VEL MEAN
1	LS-220-065	05/07/1974	473.875
2	LS-220-064	05/13/1974	480.375
3	LS-220-067	05/17/1974	481.250
4	LS-220-066	05/17/1974	480.500
5	LS-220-069	05/20/1974	481.000
6	LS-220-068	05/26/1974	482.250
7	LS-220-071	05/28/1974	476.125
8	LS-220-072	05/30/1974	480.000
9	LS-220-074	06/13/1974	477.500
10	LS-220-075	06/18/1974	479.500
11	OL-008-071	06/19/1974	482.026
12	LS-220-076	06/27/1974	481.500
13	LS-220-077	07/01/1974	482.750
14	LS-220-079	07/10/1974	485.500
15	OL-008-075	07/19/1974	483.450
16	LS-220-079	07/24/1974	482.143
17	LS-220-080	07/29/1974	480.667
18	LS-220-095	10/09/1974	485.833
19	LS-220-102	11/07/1974	482.833
20	LS-220-101	11/07/1974	484.875
21	LS-220-103	11/12/1974	482.714
22	LS-220-105	11/12/1974	480.625
23	LS-220-106	11/13/1974	476.571
24	OL-008-090	11/15/1974	486.225
25	OL-008-089	11/15/1974	483.395
26	LS-220-107	11/16/1974	485.857
27	OL-008-091	11/19/1974	487.641
28	LS-220-108	11/25/1974	484.250
29	LS-220-110	11/25/1974	483.625
30	OL-008-092	11/26/1974	491.410
31	OL-008-093	11/26/1974	489.625
32	LS-220-109	11/27/1974	481.000
33	LS-220-111	12/11/1974	481.000
34	LS-220-112	12/12/1974	480.167
35	OL-008-094	12/13/1974	486.775
36	OL-008-095	12/15/1974	490.275
37	LS-220-114	12/17/1974	479.375
38	LS-220-113	12/17/1974	480.875
39	LS-220-115	12/23/1974	480.375
40	LS-220-116	12/23/1974	479.500
41	LS-220-117	12/26/1974	477.875
42	LS-220-118	12/27/1974	480.143
43	LS-220-120	01/13/1975	476.250
44	LS-220-123	01/21/1975	480.429



```
$TIME

IOEP    =  5.

IND1    =  2.

IND2    =  4.

XMIN    = -0.99E+02.

XMAX    = -0.99E+02.

YMIN    =  0.0.

YMAX    =  0.1E+04.

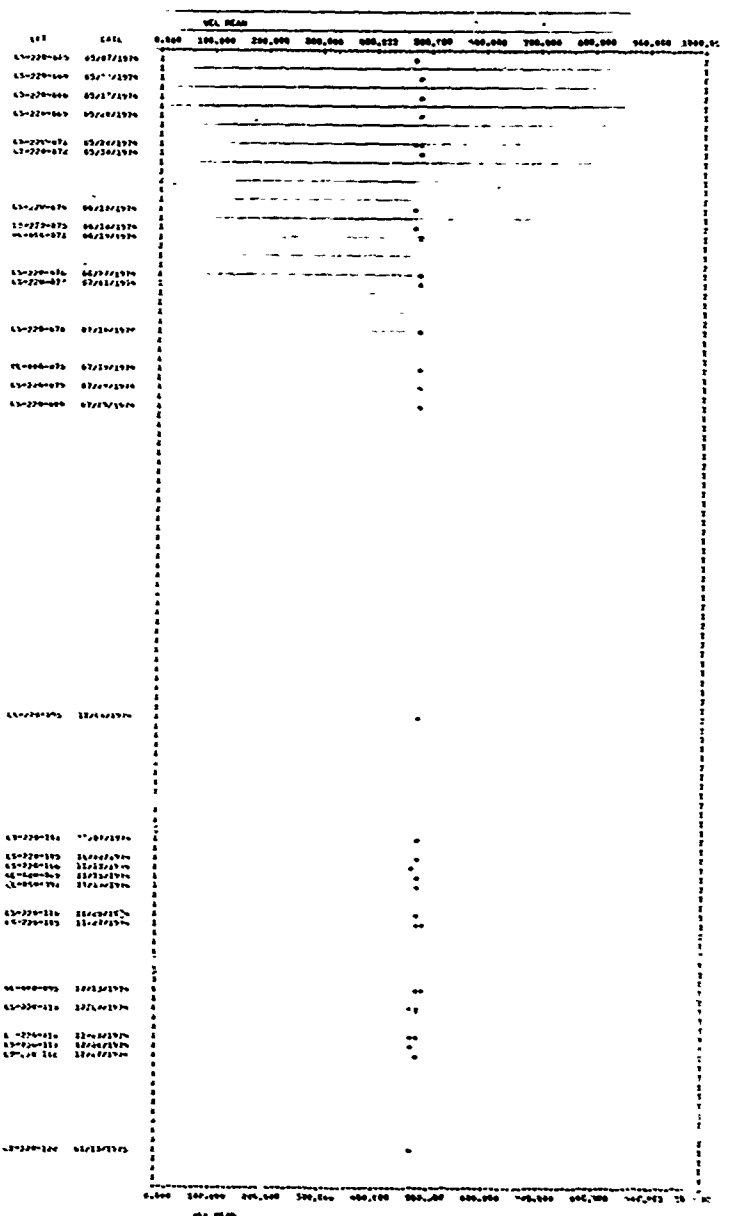
YBAR1   = -0.99E+02.

YBAR2   = -0.99E+02.

$END
```

LISTING OF INPUT DATA

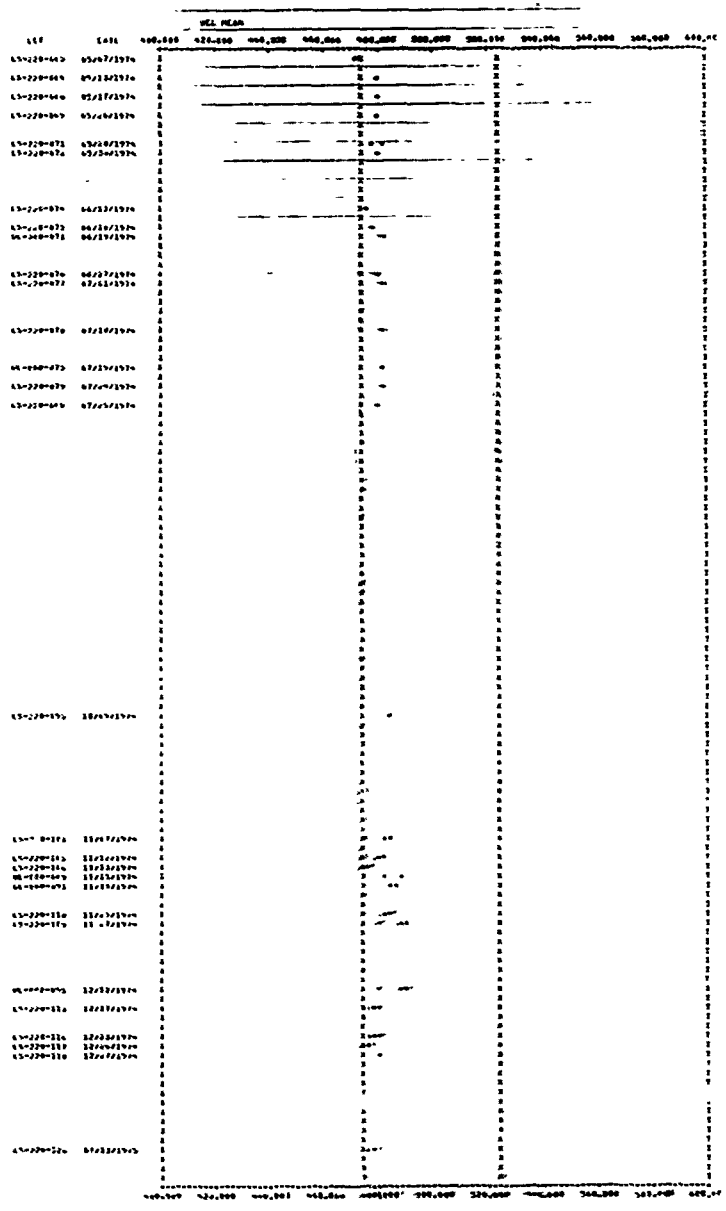
NUM	LOT	DATE	VEL MEAN
1	LS-220-065	05/07/1974	475.675
2	LS-220-064	05/15/1974	480.375
3	LS-220-067	05/17/1974	481.250
4	LS-220-066	05/17/1974	480.500
5	LS-220-069	05/20/1974	481.000
6	LS-220-068	05/20/1974	482.250
7	LS-220-071	05/20/1974	476.125
8	LS-220-072	05/30/1974	480.000
9	LS-220-074	06/13/1974	477.500
10	LS-220-075	06/16/1974	479.500
11	OL-006-071	06/19/1974	482.026
12	LS-220-076	06/27/1974	481.500
13	LS-220-077	07/01/1974	482.750
14	LS-220-078	07/10/1974	485.500
15	OL-006-075	07/19/1974	483.450
16	LS-220-079	07/24/1974	482.143
17	LS-220-080	07/29/1974	486.667
18	LS-220-095	10/09/1974	485.83.
19	LS-220-102	11/07/1974	482.833
20	LS-220-101	11/07/1974	484.875
21	LS-220-103	11/12/1974	482.714
22	LS-220-105	11/12/1974	480.625
23	LS-220-106	11/15/1974	476.571
24	OL-006-090	11/15/1974	486.225
25	OL-006-089	11/15/1974	483.395
26	LS-220-107	11/16/1974	485.657
27	OL-006-091	11/19/1974	487.641
28	LS-220-108	11/25/1974	484.250
29	LS-220-110	11/25/1974	483.625
30	OL-006-092	11/26/1974	491.410
31	OL-006-093	11/26/1974	489.625
32	LS-220-109	11/27/1974	481.000
33	LS-220-111	12/11/1974	481.000
34	LS-220-112	12/12/1974	480.167
35	OL-006-094	12/13/1974	486.775
36	OL-006-095	12/13/1974	490.275
37	LS-220-114	12/17/1974	479.375
38	LS-220-113	12/17/1974	480.875
39	LS-220-115	12/23/1974	480.375
40	LS-220-116	12/26/1974	479.500
41	LS-220-117	12/26/1974	477.875
42	LS-220-118	12/27/1974	480.143
43	LS-220-120	01/13/1975	476.250
44	LS-220-122	01/21/1975	480.429



```
$TIME
 IDEP   =  5.
 IND1   =  2.
 IND2   =  4.
 XMIN   = -0.99E+02.
 XMAX   = -0.99E+02.
 YMIN   =  0.4E+03.
 YMAX   =  0.6E+03.
 YBAR1  =  0.475E+03.
 YBAR2  =  0.525E+03.
$END
```

LISTING OF INPUT DATA

NUM	LOT	DATE	VEL MEAN
1	LS-220-065	05/07/1974	473.875
2	LS-220-064	05/15/1974	480.375
3	LS-220-067	05/17/1974	481.250
4	LS-220-066	05/17/1974	480.500
5	LS-220-069	05/20/1974	481.000
6	LS-220-068	05/26/1974	482.250
7	LS-220-071	05/26/1974	476.125
8	LS-220-072	05/30/1974	480.000
9	LS-220-074	06/15/1974	477.500
10	LS-220-075	06/16/1974	479.500
11	OL-008-071	06/19/1974	462.026
12	LS-220-076	06/27/1974	481.500
13	LS-220-077	07/01/1974	482.750
14	LS-220-078	07/10/1974	483.500
15	OL-008-075	07/19/1974	483.450
16	LS-220-079	07/24/1974	482.143
17	LS-220-080	07/29/1974	480.667
18	LS-220-095	10/05/1974	485.833
19	LS-220-102	11/07/1974	482.833
20	LS-220-101	11/07/1974	484.875
21	LS-220-103	11/12/1974	482.714
22	LS-220-105	11/12/1974	480.625
23	LS-220-106	11/13/1974	476.571
24	OL-008-090	11/15/1974	486.225
25	OL-008-089	11/15/1974	483.395
26	LS-220-107	11/18/1974	485.857
27	OL-008-091	11/19/1974	487.641
28	LS-220-108	11/25/1974	484.250
29	LS-220-110	11/25/1974	483.625
30	OL-008-092	11/26/1974	491.410
31	OL-008-093	11/26/1974	485.625
32	LS-220-109	11/27/1974	481.000
33	LS-220-111	12/11/1974	481.000
34	LS-220-112	12/12/1974	480.167
35	OL-008-094	12/13/1974	488.775
36	OL-008-095	12/13/1974	490.275
37	LS-220-114	12/17/1974	479.375
38	LS-220-113	12/17/1974	480.875
39	LS-220-115	12/23/1974	480.375
40	LS-220-116	12/23/1974	479.500
41	LS-220-117	12/26/1974	477.875
42	LS-220-118	12/27/1974	480.143
43	LS-220-120	01/15/1975	476.250
44	LS-220-123	01/21/1975	480.429



```
$SUBTPLT

IDEP    =  1.

IND1    =  6.

IND2    =  7.

IND3    =  0.

YMIN    = -0.99E+02.

YMAX    = -0.99E+02.

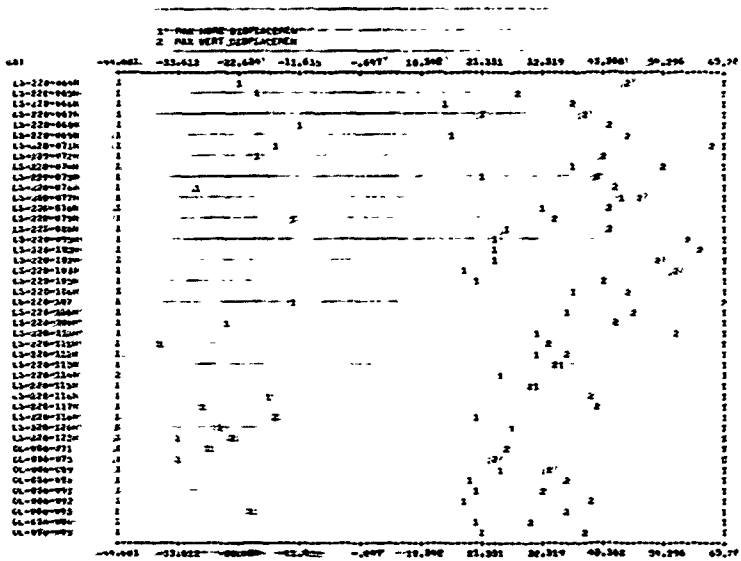
YBAR1   = -0.99E+02.

YBAR2   = -0.99E+02.

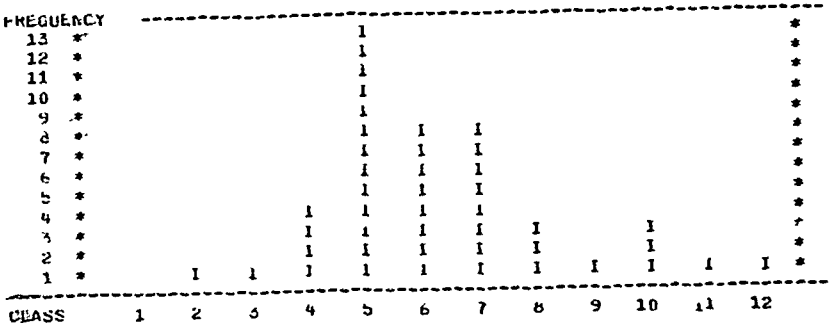
$END
```

LISTING OF INPUT DATA

NUM	LOT	MAX HORZ DISPLACEMEN	MAX VERT DISPLACEMEN
1	LS-220-064R	-21.866	48.122
2	LS-220-065R	-18.366	28.560
3	LS-220-066R	14.755	38.027
4	LS-220-067R	21.396	40.921
5	LS-220-068F	-11.191	44.827
6	LS-220-069F	16.716	46.031
7	LS-220-071R	-15.100	63.218
8	LS-220-072R	-15.117	43.882
9	LS-220-074R	36.470	54.346
10	LS-220-075R	21.757	43.167
11	LS-220-076R	-23.296	46.292
12	LS-220-077F	46.794	56.443
13	LS-220-078R	32.638	44.428
14	LS-220-079R	-12.694	34.579
15	LS-220-080R	26.569	44.920
16	LS-220-095R	24.476	38.815
17	LS-220-101R	24.058	61.059
18	LS-220-102R	25.569	53.291
19	LS-220-103R	18.595	57.009
20	LS-220-105R	26.401	44.138
21	LS-220-106R	36.405	47.589
22	LS-220-107	-12.364	65.285
23	LS-220-108R	37.009	48.868
24	LS-220-109R	-25.795	46.277
25	LS-220-110F	32.135	56.598
26	LS-220-111R	-36.641	33.868
27	LS-220-112R	31.251	37.233
28	LS-220-113R	35.960	35.596
29	LS-220-114R	25.286	-44.601
30	LS-220-115R	31.446	30.457
31	LS-220-116R	-16.862	41.252
32	LS-220-117F	-26.859	43.100
33	LS-220-118R	20.627	-15.268
34	LS-220-120R	27.681	-25.481
35	LS-220-123R	-33.235	-22.905
36	UL-008-071	-28.100	26.227
37	UL-008-075	-32.651	24.087
38	UL-008-085	25.083	33.672
39	UL-008-090	19.392	37.056
40	UL-008-091	21.245	32.983
41	UL-008-092	18.378	41.656
42	UL-008-093	-20.045	37.493
43	UL-008-094	20.605	40.984
44	UL-008-095	21.977	41.865


1 MAX HORZ DISPLACEMENT
2 MAX VERT DISPLACEMENT

```
$HIST
 IDEP    =  5,
 NBAR    =  10,
 NSP     =  4,
 RUP     = -0.99E+02,
 RLOW    = -0.99E+02,
 $END
```



HISTOGRAM SUMMARY

INTERVAL	LOWER BOUND	UPPER BOUND	FREQUENCY	PERCENT	CUMULATIVE FREQ	CUMULATIVE %
1	**********	473.874	0	0.00	0	0.00
2	473.874	475.628	1	2.27	1	2.27
3	475.628	477.381	1	2.27	2	4.55
4	477.382	479.135	4	9.09	6	13.64
5	479.136	480.888	13	29.55	19	43.18
6	480.889	482.642	8	18.18	27	61.36
7	482.643	484.395	8	18.18	35	79.55
8	484.396	486.149	3	6.82	38	86.36
9	486.150	487.902	1	2.27	39	88.64
10	487.903	489.656	3	6.82	42	95.45
11	489.657	491.409	1	2.27	43	97.73
12	491.410	**********	1	2.27	44	100.00

VEL MEAN
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```
$TABLE
ITABLE  =  1,
$END
```

NORMAL DISTRIBUTION

A1 = AREA UNDER CURVE FROM 0 TO (X-U)/S
A2 = AREA IN BOTH TAILS FROM -INF TO (X-U)/S AND (X-U)/S TO +INF
X = RANDOM VARIABLE
U = MEAN VALUE OF X
S = STANDARD DEVIATION OF X
RO = RELATIVE FREQUENCY IN TERMS OF MEAN FREQUENCY

(X-U)/S	A1	A2	RO
0.00	0.0000	1.0000	1.0000
.05	.0199	.9602	.9986
.10	.0398	.9203	.9950
.15	.0596	.8808	.9888
.20	.0793	.8415	.9802
.25	.0987	.8026	.9692
.30	.1179	.7642	.9560
.35	.1368	.7263	.9405
.40	.1554	.6892	.9231
.45	.1736	.6527	.9037
.50	.1915	.6171	.8825
.55	.2088	.5823	.8596
.60	.2257	.5485	.8353
.65	.2422	.5157	.8096
.70	.2580	.4839	.7827
.75	.2734	.4533	.7548
.80	.2881	.4237	.7262
.85	.3023	.3953	.6968
.90	.3159	.3681	.6670
.95	.3289	.3421	.6368
1.00	.3413	.3173	.6065
1.05	.3531	.2938	.5762
1.10	.3643	.2714	.5461
1.15	.3749	.2502	.5162
1.20	.3849	.2302	.4868
1.25	.3944	.2113	.4578
1.30	.4032	.1936	.4296

1.35	.4115	.1771	.4020
1.40	.4192	.1616	.3753
1.45	.4265	.1470	.3495
1.50	.4332	.1336	.3247
1.55	.4394	.1212	.3008
1.60	.4452	.1096	.2780
1.65	.4505	.0990	.2563
1.70	.4554	.0892	.2376
1.75	.4599	.0802	.2163
1.80	.4641	.0720	.1979
1.85	.4678	.0644	.1806
1.90	.4713	.0574	.1645
1.95	.4744	.0512	.1494
2.00	.4772	.0455	.1353
2.05	.4798	.0404	.1223
2.10	.4821	.0358	.1040
2.15	.4842	.0316	.0992
2.20	.4861	.0278	.0890
2.25	.4878	.0244	.0796
2.30	.4893	.0214	.0709
2.35	.4906	.0188	.0632
2.40	.4918	.0164	.0561
2.45	.4929	.0143	.0497
2.50	.4938	.0124	.0439
2.55	.4946	.0108	.0387
2.60	.4953	.0093	.0341
2.65	.4960	.0080	.0299
2.70	.4965	.0070	.0261
2.75	.4970	.0060	.0228
2.80	.4974	.0051	.0196
2.85	.4978	.0044	.0172
2.90	.4981	.0037	.0150
2.95	.4984	.0032	.0129
3.00	.4987	.0027	.0111

****

PROGRAM FINISHED

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END-1-76